



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 786 519 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.07.1997 Bulletin 1997/31

(51) Int Cl.⁶: **C12N 15/00**

(21) Application number: **97100117.7**

(22) Date of filing: **07.01.1997**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**
Designated Extension States:
AL LT LV RO SI

(30) Priority: **05.01.1996 US 9861**

(71) Applicant: **HUMAN GENOME SCIENCES, INC.**
Rockville, MD 20850-3338 (US)

(72) Inventors:
• **Kunsch, Charles A.**
Gaithersburg, Maryland 20882 (US)

- **Choi, Gii H.**
Rockville, Maryland 20850 (US)
- **Barash, Steven C.**
Rockville, Maryland 20850 (US)
- **Dillon, Patrick J.**
Gaithersburg, Maryland 20879 (US)
- **Fannon, Michael R.**
Silver Spring, Maryland 20906 (US)
- **Rosen, Craig A.**
Laytonsville, Maryland 20882 (US)

(74) Representative: **VOSSIUS & PARTNER**
Postfach 86 07 67
81634 München (DE)

(54) **Staphylococcus aureus polynucleotides and sequences**

(57) The present invention provides polynucleotide sequences of the genome of *Staphylococcus aureus*, polypeptide sequences encoded by the polynucleotide sequences, corresponding polynucleotides and polypeptides, vectors and hosts comprising the polynu-

cleotides, and assays and other uses thereof. The present invention further provides polynucleotide and polypeptide sequence information stored on computer readable media, and computer-based systems and methods which facilitate its use.

EP 0 786 519 A2

Description

The present invention relates to the field of molecular biology. In particular, it relates to, among other things, nucleotide sequences of *Staphylococcus aureus*, contigs, ORFs, fragments, probes, primers and related polynucleotides thereof, peptides and polypeptides encoded by the sequences, and uses of the polynucleotides and sequences thereof, such as in fermentation, polypeptide production, assays and pharmaceutical development, among others.

The genus *Staphylococcus* includes at least 20 distinct species. (For a review see Novick, R. P., *The Staphylococcus* as a Molecular Genetic System, Chapter 1, pgs. 1-37 in *MOLECULAR BIOLOGY OF THE STAPHYLOCOCCI*, R. Novick, Ed., VCH Publishers, New York (1990)). Species differ from one another by 80% or more, by hybridization kinetics, whereas strains within a species are at least 90% identical by the same measure.

The species *Staphylococcus aureus*, a gram-positive, facultatively aerobic, clump-forming cocci, is among the most important etiological agents of bacterial infection in humans, as discussed briefly below.

Human Health and *S. Aureus*

Staphylococcus aureus is a ubiquitous pathogen. (See, for instance, Mims *et al.*, *MEDICAL MICROBIOLOGY*, Mosby-Year Book Europe Limited, London, UK (1993)). It is an etiological agent of a variety of conditions, ranging in severity from mild to fatal. A few of the more common conditions caused by *S. aureus* infection are burns, cellulitis, eyelid infections, food poisoning, joint infections, neonatal conjunctivitis, osteomyelitis, skin infections, surgical wound infection, scalded skin syndrome and toxic shock syndrome, some of which are described further below.

Burns

Burn wounds generally are sterile initially. However, they generally compromise physical and immune barriers to infection, cause loss of fluid and electrolytes and result in local or general physiological dysfunction. After cooling, contact with viable bacteria results in mixed colonization at the injury site. Infection may be restricted to the non-viable debris on the burn surface ("eschar"), it may progress into full skin infection and invade viable tissue below the eschar and it may reach below the skin, enter the lymphatic and blood circulation and develop into septicaemia. *S. aureus* is among the most important pathogens typically found in burn wound infections. It can destroy granulation tissue and produce severe septicaemia.

Cellulitis

Cellulitis, an acute infection of the skin that expands from a typically superficial origin to spread below the cutaneous layer, most commonly is caused by *S. aureus* in conjunction with *S. pyogenes*. Cellulitis can lead to systemic infection. In fact, cellulitis can be one aspect of synergistic bacterial gangrene. This condition typically is caused by a mixture of *S. aureus* and microaerophilic *streptococci*. It causes necrosis and treatment is limited to excision of the necrotic tissue. The condition often is fatal.

Eyelid infections

S. aureus is the cause of styes and of sticky eye" in neonates, among other eye infections. Typically such infections are limited to the surface of the eye, and may occasionally penetrate the surface with more severe consequences.

Food poisoning

Some strains of *S. aureus* produce one or more of five serologically distinct, heat and acid stable enterotoxins that are not destroyed by digestive process of the stomach and small intestine (enterotoxins A-E). Ingestion of the toxin, in sufficient quantities, typically results in severe vomiting, but not diarrhoea. The effect does not require viable bacteria. Although the toxins are known, their mechanism of action is not understood.

Joint infections

S. aureus infects bone joints causing diseases such osteomyelitis.

Osteomyelitis

S. aureus is the most common causative agent of haematogenous osteomyelitis. The disease tends to occur in

children and adolescents more than adults and it is associated with non-penetrating injuries to bones. Infection typically occurs in the long end of growing bone, hence its occurrence in physically immature populations. Most often, infection is localized in the vicinity of sprouting capillary loops adjacent to epiphysial growth plates in the end of long, growing bones.

Skin infections

S. aureus is the most common pathogen of such minor skin infections as abscesses and boils. Such infections often are resolved by normal host response mechanisms, but they also can develop into severe internal infections. Recurrent infections of the nasal passages plague nasal carriers of *S. aureus*.

Surgical Wound Infections

Surgical wounds often penetrate far into the body. Infection of such wound thus poses a grave risk to the patient. *S. aureus* is the most important causative agent of infections in surgical wounds. *S. aureus* is unusually adept at invading surgical wounds; sutured wounds can be infected by far fewer *S. aureus* cells than are necessary to cause infection in normal skin. Invasion of surgical wound can lead to severe *S. aureus* septicaemia. Invasion of the blood stream by *S. aureus* can lead to seeding and infection of internal organs, particularly heart valves and bone, causing systemic diseases, such as endocarditis and osteomyelitis.

Scalded Skin Syndrome

S. aureus is responsible for "scalded skin syndrome" (also called toxic epidermal necrosis, Ritter's disease and Lyell's disease). This disease occurs in older children, typically in outbreaks caused by flowering of *S. aureus* strains produce exfoliation (also called scalded skin syndrome toxin). Although the bacteria initially may infect only a minor lesion, the toxin destroys intercellular connections, spreads epidermal layers and allows the infection to penetrate the outer layer of the skin, producing the desquamation that typifies the disease. Shedding of the outer layer of skin generally reveals normal skin below, but fluid lost in the process can produce severe injury in young children if it is not treated properly.

Toxic Shock Syndrome

Toxic shock syndrome is caused by strains of *S. aureus* that produce the so-called toxic shock syndrome toxin. The disease can be caused by *S. aureus* infection at any site, but it is too often erroneously viewed exclusively as a disease solely of women who use tampons. The disease involves toxemia and septicaemia, and can be fatal.

Nocosomal Infections

In the 1984 National Nosocomial Infection Surveillance Study ("NNIS") *S. aureus* was the most prevalent agent of surgical wound infections in many hospital services, including medicine, surgery, obstetrics, pediatrics and newborns.

Resistance to drugs of S. aureus strains

Prior to the introduction of penicillin the prognosis for patients seriously infected with *S. aureus* was unfavorable. Following the introduction of penicillin in the early 1940s even the worst *S. aureus* infections generally could be treated successfully. The emergence of penicillin-resistant strains of *S. aureus* did not take long, however. Most strains of *S. aureus* encountered in hospital infections today do not respond to penicillin; although, fortunately, this is not the case for *S. aureus* encountered in community infections.

It is well known now that penicillin-resistant strains of *S. aureus* produce a lactamase which converts penicillin to penicillinoic acid, and thereby destroys antibiotic activity. Furthermore, the lactamase gene often is propagated episomally, typically on a plasmid, and often is only one of several genes on an episomal element that, together, confer multidrug resistance.

Methicillins, introduced in the 1960s, largely overcame the problem of penicillin resistance in *S. aureus*. These compounds conserve the portions of penicillin responsible for antibiotic activity and modify or alter other portions that make penicillin a good substrate for inactivating lactamases. However, methicillin resistance has emerged in *S. aureus*, along with resistance to many other antibiotics effective against this organism, including aminoglycosides, tetracycline, chloramphenicol, macrolides and lincosamides. In fact, methicillin-resistant strains of *S. aureus* generally are multiply drug resistant.

The molecular genetics of most types of drug resistance in *S. aureus* has been elucidated (See Lyon *et al.*, *Microbiology Reviews* 51: 88-134 (1987)). Generally, resistance is mediated by plasmids, as noted above regarding penicillin resistance; however, several stable forms of drug resistance have been observed that apparently involve integration of a resistance element into the *S. aureus* genome itself.

Thus far each new antibiotic gives rise to resistance strains, strains emerge that are resistance to multiple drugs and increasingly persistent forms of resistance begin to emerge. Drug resistance of *S. aureus* infections already poses significant treatment difficulties, which are likely to get much worse unless new therapeutic agents are developed.

Molecular Genetics of *Staphylococcus Aureus*

Despite its importance in, among other things, human disease, relatively little is known about the genome of this organism.

Most genetic studies of *S. aureus* have been carried out using the strain NCTC8325, which contains prophages psi11 psi12 and psi13, and the UV-cured derivative of this strain, 8325-4 (also referred to as RN450), which is free of the prophages.

These studies revealed that the *S. aureus* genome, like that of other *staphylococci*, consists of one circular, covalently closed, double-stranded DNA and a collection of so-called variable accessory genetic elements, such as prophages, plasmids, transposons and the like.

Physical characterization of the genome has not been carried out in any detail. Pattee *et al.* published a low resolution and incomplete genetic and physical map of the chromosome of *S. aureus* strain NCTC 8325. (Pattee *et al.* Genetic and Physical Mapping of Chromosome of *Staphylococcus aureus* NCTC 8325, Chapter 11, pgs. 163-169 in. MOLECULAR BIOLOGY OF THE STAPHYLOCOCCI, R.P. Novick, Ed., VCH Publishers, New York, (1990) The genetic map largely was produced by mapping insertions of Tn551 and Tn4001, which, respectively, confer erythromycin and gentamicin resistance, and by analysis of SmaI-digested DNA by Pulsed Field Gel Electrophoresis ("PFGE").

The map was of low resolution; even estimating the physical size of the genome was difficult, according to the investigators. The size of the largest SmaI chromosome fragment, for instance, was too large for accurate sizing by PFGE. To estimate its size, additional restriction sites had to be introduced into the chromosome using a transposon containing a SmaI recognition sequence.

In sum, most physical characteristics and almost all of the genes of *Staphylococcus aureus* are unknown. Among the few genes that have been identified, most have not been physically mapped or characterized in detail. Only a very few genes of this organism have been sequenced. (See, for instance Thornsberry, J., *Antimicrobial Chemotherapy* 21 Suppl. C: 9-16 (1988), current versions of GENBANK and other nucleic acid databases, and references that relate to the genome of *S. aureus* such as those set out elsewhere herein.)

It is clear that the etiology of diseases mediated or exacerbated by *S. aureus* infection involves the programmed expression of *S. aureus* genes, and that characterizing the genes and their patterns of expression would add dramatically to our understanding of the organism and its host interactions. Knowledge of *S. aureus* genes and genomic organization would dramatically improve understanding of disease etiology and lead to improved and new ways of preventing, ameliorating, arresting and reversing diseases. Moreover, characterized genes and genomic fragments of *S. aureus* would provide reagents for, among other things, detecting, characterizing and controlling *S. aureus* infections. There is a need therefore to characterize the genome of *S. aureus* and for polynucleotides and sequences of this organism.

The present invention is based on the sequencing of fragments of the *Staphylococcus aureus* genome. The primary nucleotide sequences which were generated are provided in SEQ ID NOS: 1-5,191.

The present invention provides the nucleotide sequence of several thousand contigs of the *Staphylococcus aureus* genome, which are listed in tables below and set out in the Sequence Listing submitted herewith, and representative fragments thereof, in a form which can be readily used, analyzed, and interpreted by a skilled artisan. In one embodiment, the present invention is provided as contiguous strings of primary sequence information corresponding to the nucleotide sequences depicted in SEQ ID NOS:1-5,191.

The present invention further provides nucleotide sequences which are at least 95%, preferably 99% and most preferably 99.9%, identical to the nucleotide sequences of SEQ ID NOS:1-5,191.

The nucleotide sequence of SEQ ID NOS:1-5,191, a representative fragment thereof, or a nucleotide sequence which is at least 95%, preferably 99% and most preferably 99.9%, identical to the nucleotide sequence of SEQ ID NOS:1-5,191 may be provided in a variety of mediums to facilitate its use. In one application of this embodiment, the sequences of the present invention are recorded on computer readable media. Such media includes, but is not limited to: magnetic storage media, such as floppy discs, hard disc storage medium, and magnetic tape; optical storage media such as CD-ROM; electrical storage media such as RAM and ROM; and hybrids of these categories such as magnetic/optical storage media.

The present invention further provides systems, particularly computer-based systems which contain the sequence

information herein described stored in a data storage means. Such systems are designed to identify commercially important fragments of the *Staphylococcus aureus* genome.

Another embodiment of the present invention is directed to fragments, preferably isolated fragments, of the *Staphylococcus aureus* genome having particular structural or functional attributes. Such fragments of the *Staphylococcus aureus* genome of the present invention include, but are not limited to, fragments which encode peptides, hereinafter referred to as open reading frames or ORFs," fragments which modulate the expression of an operably linked ORF, hereinafter referred to as expression modulating fragments or EMFs," and fragments which can be used to diagnose the presence of *Staphylococcus aureus* in a sample, hereinafter referred to as diagnostic fragments or "DFs."

Each of the ORFs in fragments of the *Staphylococcus aureus* genome disclosed in Tables 1-3, and the EMFs found 5' to the ORFs, can be used in numerous ways as polynucleotide reagents. For instance, the sequences can be used as diagnostic probes or amplification primers for detecting or determining the presence of a specific microbe in a sample, to selectively control gene expression in a host and in the production of polypeptides, such as polypeptides encoded by ORFs of the present invention, particular those polypeptides that have a pharmacological activity.

The present invention further includes recombinant constructs comprising one or more fragments of the *Staphylococcus aureus* genome of the present invention. The recombinant constructs of the present invention comprise vectors, such as a plasmid or viral vector, into which a fragment of the *Staphylococcus aureus* has been inserted.

The present invention further provides host cells containing any of the isolated fragments of the *Staphylococcus aureus* genome of the present invention. The host cells can be a higher eukaryotic host cell, such as a mammalian cell, a lower eukaryotic cell, such as a yeast cell, or a procaryotic cell such as a bacterial cell.

The present invention is further directed to polypeptides and proteins, preferably isolated polypeptides and proteins, encoded by ORFs of the present invention. A variety of methods, well known to those of skill in the art, routinely may be utilized to obtain any of the polypeptides and proteins of the present invention. For instance, polypeptides and proteins of the present invention having relatively short, simple amino acid sequences readily can be synthesized using commercially available automated peptide synthesizers. Polypeptides and proteins of the present invention also may be purified from bacterial cells which naturally produce the protein. Yet another alternative is to purify polypeptide and proteins of the present invention can from cells which have been altered to express them.

The invention further provides polypeptides, preferably isolated polypeptides, comprising *Staphylococcus aureus* epitopes and vaccine compositions comprising such polypeptides. Also provided are methods for vaccinating an individual against *Staphylococcus aureus* infection.

The invention further provides methods of obtaining homologs of the fragments of the *Staphylococcus aureus* genome of the present invention and homologs of the proteins encoded by the ORFs of the present invention. Specifically, by using the nucleotide and amino acid sequences disclosed herein as a probe or as primers, and techniques such as PCR cloning and colony/plaque hybridization, one skilled in the art can obtain homologs.

The invention further provides antibodies which selectively bind polypeptides and proteins of the present invention. Such antibodies include both monoclonal and polyclonal antibodies.

The invention further provides hybridomas which produce the above-described antibodies. A hybridoma is an immortalized cell line which is capable of secreting a specific monoclonal antibody.

The present invention further provides methods of identifying test samples derived from cells which express one of the ORFs of the present invention, or a homolog thereof. Such methods comprise incubating a test sample with one or more of the antibodies of the present invention, or one or more of the DFs or antigens of the present invention, under conditions which allow a skilled artisan to determine if the sample contains the ORF or product produced therefrom.

In another embodiment of the present invention, kits are provided which contain the necessary reagents to carry out the above-described assays.

Specifically, the invention provides a compartmentalized kit to receive, in close confinement, one or more containers which comprises: (a) a first container comprising one of the antibodies, antigens, or one of the DFs of the present invention; and (b) one or more other containers comprising one or more of the following: wash reagents, reagents capable of detecting presence of bound antibodies, antigens or hybridized DFs.

Using the isolated proteins of the present invention, the present invention further provides methods of obtaining and identifying agents capable of binding to a polypeptide or protein encoded by one of the ORFs of the present invention. Specifically, such agents include, as further described below, antibodies, peptides, carbohydrates, pharmaceutical agents and the like. Such methods comprise steps of: (a) contacting an agent with an isolated protein encoded by one of the ORFs of the present invention; and (b) determining whether the agent binds to said protein.

The present genomic sequences of *Staphylococcus aureus* will be of great value to all laboratories working with this organism and for a variety of commercial purposes. Many fragments of the *Staphylococcus aureus* genome will be immediately identified by similarity searches against GenBank or protein databases and will be of immediate value to *Staphylococcus aureus* researchers and for immediate commercial value for the production of proteins or to control gene expression.

The methodology and technology for elucidating extensive genomic sequences of bacterial and other genomes

has and will greatly enhance the ability to analyze and understand chromosomal organization. In particular, sequenced contigs and genomes will provide the models for developing tools for the analysis of chromosome structure and function, including the ability to identify genes within large segments of genomic DNA, the structure, position, and spacing of regulatory elements, the identification of genes with potential industrial applications, and the ability to do comparative genomic and molecular phylogeny.

FIGURE 1 is a block diagram of a computer system (102) that can be used to implement computer-based systems of present invention.

FIGURE 2 is a schematic diagram depicting the data flow and computer programs used to collect, assemble, edit and annotate the contigs of the *Staphylococcus aureus* genome of the present invention. Both Macintosh and Unix platforms are used to handle the AB 373 and 377 sequence data files, largely as described in Kerlavage *et al.*, *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences*, 585, IEEE Computer Society Press, Washington D.C. (1993). Factura (AB) is a Macintosh program designed for automatic vector sequence removal and end-trimming of sequence files. The program Loadis runs on a Macintosh platform and parses the feature data extracted from the sequence files by Factura to the Unix based *Staphylococcus aureus* relational database. Assembly of contigs (and whole genome sequences) is accomplished by retrieving a specific set of sequence files and their associated features using extrseq, a Unix utility for retrieving sequences from an SQL database. The resulting sequence file is processed by seq_filter to trim portions of the sequences with more than 2% ambiguous nucleotides. The sequence files were assembled using TIGR Assembler, an assembly engine designed at The Institute for Genomic Research (TIGR*) for rapid and accurate assembly of thousands of sequence fragments. The collection of contigs generated by the assembly step is loaded into the database with the lassie program. Identification of open reading frames (ORFs) is accomplished by processing contigs with zorf. The ORFs are searched against *S. aureus* sequences from Genbank and against all protein sequences using the BLASTN and BLASTP programs, described in Altschul *et al.*, *J. Mol. Biol.* 215: 403-410 (1990)). Results of the ORF determination and similarity searching steps were loaded into the database. As described below, some results of the determination and the searches are set out in Tables 1-3.

The present invention is based on the sequencing of fragments of the *Staphylococcus aureus* genome and analysis of the sequences. The primary nucleotide sequences generated by sequencing the fragments are provided in SEQ ID NOS:1-5,191. (As used herein, the "primary sequence" refers to the nucleotide sequence represented by the IUPAC nomenclature system.)

In addition to the aforementioned *Staphylococcus aureus* polynucleotide and polynucleotide sequences, the present invention provides the nucleotide sequences of SEQ ID NOS:1-5,191, or representative fragments thereof, in a form which can be readily used, analyzed, and interpreted by a skilled artisan.

As used herein, a "representative fragment of the nucleotide sequence depicted in SEQ ID NOS:1-5,191" refers to any portion of the SEQ ID NOS:1-5,191 which is not presently represented within a publicly available database. Preferred representative fragments of the present invention are *Staphylococcus aureus* open reading frames (ORFs*), expression modulating fragment (EMFs*) and fragments which can be used to diagnose the presence of *Staphylococcus aureus* in sample ("DFs"). A non-limiting identification of preferred representative fragments is provided in Tables 1-3.

As discussed in detail below, the information provided in SEQ ID NOS:1-5,191 and in Tables 1-3 together with routine cloning, synthesis, sequencing and assay methods will enable those skilled in the art to clone and sequence all "representative fragments" of interest, including open reading frames encoding a large variety of *Staphylococcus aureus* proteins.

While the presently disclosed sequences of SEQ ID NOS:1-5,191 are highly accurate, sequencing techniques are not perfect and, in relatively rare instances, further investigation of a fragment or sequence of the invention may reveal a nucleotide sequence error present in a nucleotide sequence disclosed in SEQ ID NOS:1-5,191. However, once the present invention is made available (*i.e.*, once the information in SEQ ID NOS:1-5,191 and Tables 1-3 has been made available), resolving a rare sequencing error in SEQ ID NOS:1-5,191 will be well within the skill of the art. The present disclosure makes available sufficient sequence information to allow any of the described contigs or portions thereof to be obtained readily by straightforward application of routine techniques. Further sequencing of such polynucleotide may proceed in like manner using manual and automated sequencing methods which are employed ubiquitous in the art. Nucleotide sequence editing software is publicly available. For example, Applied Biosystem's (AB) AutoAssembler can be used as an aid during visual inspection of nucleotide sequences. By employing such routine techniques potential errors readily may be identified and the correct sequence then may be ascertained by targeting further sequencing effort, also of a routine nature, to the region containing the potential error.

Even if all of the very rare sequencing errors in SEQ ID NOS:1-5,191 were corrected, the resulting nucleotide sequences would still be at least 95% identical, nearly all would be at least 99% identical, and the great majority would be at least 99.9% identical to the nucleotide sequences of SEQ ID NOS:1-5,191.

As discussed elsewhere herein, polynucleotides of the present invention readily may be obtained by routine application of well known and standard procedures for cloning and sequencing DNA. Detailed methods for obtaining

libraries and for sequencing are provided below, for instance. A wide variety of *Staphylococcus aureus* strains that can be used to prepare *S. aureus* genomic DNA for cloning and for obtaining polynucleotides of the present invention are available to the public from recognized depository institutions, such as the American Type Culture Collection (ATCC®).

The nucleotide sequences of the genomes from different strains of *Staphylococcus aureus* differ somewhat. However, the nucleotide sequences of the genomes of all *Staphylococcus aureus* strains will be at least 95% identical, in corresponding part, to the nucleotide sequences provided in SEQ ID NOS:1-5,191. Nearly all will be at least 99% identical and the great majority will be 99.9% identical.

Thus, the present invention further provides nucleotide sequences which are at least 95%, preferably 99% and most preferably 99.9% identical to the nucleotide sequences of SEQ ID NOS:1-5,191, in a form which can be readily used, analyzed and interpreted by the skilled artisan.

Methods for determining whether a nucleotide sequence is at least 95%, at least 99% or at least 99.9% identical to the nucleotide sequences of SEQ ID NOS:1-5,191 are routine and readily available to the skilled artisan. For example, the well known fasta algorithm described in Pearson and Lipman, *Proc. Natl. Acad. Sci. USA* **85**: 2444 (1988) can be used to generate the percent identity of nucleotide sequences. The BLASTN program also can be used to generate an identity score of polynucleotides compared to one another.

COMPUTER RELATED EMBODIMENTS

The nucleotide sequences provided in SEQ ID NOS:1-5,191, a representative fragment thereof, or a nucleotide sequence at least 95%, preferably at least 99% and most preferably at least 99.9% identical to a polynucleotide sequence of SEQ ID NOS:1-5,191 may be "provided" in a variety of mediums to facilitate use thereof. As used herein, "provided" refers to a manufacture, other than an isolated nucleic acid molecule, which contains a nucleotide sequence of the present invention; i.e., a nucleotide sequence provided in SEQ ID NOS:1-5,191, a representative fragment thereof, or a nucleotide sequence at least 95%, preferably at least 99% and most preferably at least 99.9% identical to a polynucleotide of SEQ ID NOS:1-5,191. Such a manufacture provides a large portion of the *Staphylococcus aureus* genome and parts thereof (e.g., a *Staphylococcus aureus* open reading frame (ORF)) in a form which allows a skilled artisan to examine the manufacture using means not directly applicable to examining the *Staphylococcus aureus* genome or a subset thereof as it exists in nature or in purified form.

In one application of this embodiment, a nucleotide sequence of the present invention can be recorded on computer readable media. As used herein, "computer readable media" refers to any medium which can be read and accessed directly by a computer. Such media include, but are not limited to: magnetic storage media, such as floppy discs, hard disc storage medium, and magnetic tape; optical storage media such as CD-ROM; electrical storage media such as RAM and ROM; and hybrids of these categories, such as magnetic/optical storage media. A skilled artisan can readily appreciate how any of the presently known computer readable mediums can be used to create a manufacture comprising computer readable medium having recorded thereon a nucleotide sequence of the present invention. Likewise, it will be clear to those of skill how additional computer readable media that may be developed also can be used to create analogous manufactures having recorded thereon a nucleotide sequence of the present invention.

As used herein, "recorded" refers to a process for storing information on computer readable medium. A skilled artisan can readily adopt any of the presently known methods for recording information on computer readable medium to generate manufactures comprising the nucleotide sequence information of the present invention.

A variety of data storage structures are available to a skilled artisan for creating a computer readable medium having recorded thereon a nucleotide sequence of the present invention. The choice of the data storage structure will generally be based on the means chosen to access the stored information. In addition, a variety of data processor programs and formats can be used to store the nucleotide sequence information of the present invention on computer readable medium. The sequence information can be represented in a word processing text file, formatted in commercially-available software such as WordPerfect and MicroSoft Word, or represented in the form of an ASCII file, stored in a database application, such as DB2, Sybase, Oracle, or the like. A skilled artisan can readily adapt any number of data-processor structuring formats (e.g., text file or database) in order to obtain computer readable medium having recorded thereon the nucleotide sequence information of the present invention.

Computer software is publicly available which allows a skilled artisan to access sequence information provided in a computer readable medium. Thus, by providing in computer readable form the nucleotide sequences of SEQ ID NOS:1-5,191, a representative fragment thereof, or a nucleotide sequence at least 95%, preferably at least 99% and most preferably at least 99.9% identical to a sequence of SEQ ID NOS:1-5,191 the present invention enables the skilled artisan routinely to access the provided sequence information for a wide variety of purposes.

The examples which follow demonstrate how software which implements the BLAST (Altschul *et al.*, *J. Mol. Biol.* **215**:403-410 (1990)) and BLAZE (Brutlag *et al.*, *Comp. Chem.* **17**:203-207 (1993)) search algorithms on a Sybase system was used to identify open reading frames (ORFs) within the *Staphylococcus aureus* genome which contain homology to ORFs or proteins from both *Staphylococcus aureus* and from other organisms. Among the ORFs discussed

herein are protein encoding fragments of the *Staphylococcus aureus* genome useful in producing commercially important proteins, such as enzymes used in fermentation reactions and in the production of commercially useful metabolites.

The present invention further provides systems, particularly computer-based systems, which contain the sequence information described herein. Such systems are designed to identify, among other things, commercially important fragments of the *Staphylococcus aureus* genome.

As used herein, "a computer-based system" refers to the hardware means, software means, and data storage means used to analyze the nucleotide sequence information of the present invention. The minimum hardware means of the computer-based systems of the present invention comprises a central processing unit (CPU), input means, output means, and data storage means. A skilled artisan can readily appreciate that any one of the currently available computer-based system are suitable for use in the present invention.

As stated above, the computer-based systems of the present invention comprise a data storage means having stored therein a nucleotide sequence of the present invention and the necessary hardware means and software means for supporting and implementing a search means.

As used herein, "data storage means" refers to memory which can store nucleotide sequence information of the present invention, or a memory access means which can access manufactures having recorded thereon the nucleotide sequence information of the present invention.

As used herein, "search means" refers to one or more programs which are implemented on the computer-based system to compare a target sequence or target structural motif with the sequence information stored within the data storage means. Search means are used to identify fragments or regions of the present genomic sequences which match a particular target sequence or target motif. A variety of known algorithms are disclosed publicly and a variety of commercially available software for conducting search means are and can be used in the computer-based systems of the present invention. Examples of such software includes, but is not limited to, MacPattern (EMBL), BLASTN and BLASTX (NCBIA). A skilled artisan can readily recognize that any one of the available algorithms or implementing software packages for conducting homology searches can be adapted for use in the present computer-based systems.

As used herein, a "target sequence" can be any DNA or amino acid sequence of six or more nucleotides or two or more amino acids. A skilled artisan can readily recognize that the longer a target sequence is, the less likely a target sequence will be present as a random occurrence in the database. The most preferred sequence length of a target sequence is from about 10 to 100 amino acids or from about 30 to 300 nucleotide residues. However, it is well recognized that searches for commercially important fragments, such as sequence fragments involved in gene expression and protein processing, may be of shorter length.

As used herein, "a target structural motif," or "target motif," refers to any rationally selected sequence or combination of sequences in which the sequence(s) are chosen based on a three-dimensional configuration which is formed upon the folding of the target motif. There are a variety of target motifs known in the art. Protein target motifs include, but are not limited to, enzymic active sites and signal sequences. Nucleic acid target motifs include, but are not limited to, promoter sequences, hairpin structures and inducible expression elements (protein binding sequences).

A variety of structural formats for the input and output means can be used to input and output the information in the computer-based systems of the present invention. A preferred format for an output means ranks fragments of the *Staphylococcus aureus* genomic sequences possessing varying degrees of homology to the target sequence or target motif. Such presentation provides a skilled artisan with a ranking of sequences which contain various amounts of the target sequence or target motif and identifies the degree of homology contained in the identified fragment.

A variety of comparing means can be used to compare a target sequence or target motif with the data storage means to identify sequence fragments of the *Staphylococcus aureus* genome. In the present examples, implementing software which implement the BLAST and BLAZE algorithms, described in Altschul *et al.*, *J. Mol. Biol.* 215: 403-410 (1990), was used to identify open reading frames within the *Staphylococcus aureus* genome. A skilled artisan can readily recognize that any one of the publicly available homology search programs can be used as the search means for the computer-based systems of the present invention. Of course, suitable proprietary systems that may be known to those of skill also may be employed in this regard.

Figure 1 provides a block diagram of a computer system illustrative of embodiments of this aspect of present invention. The computer system 102 includes a processor 106 connected to a bus 104. Also connected to the bus 104 are a main memory 108 (preferably implemented as random access memory, RAM) and a variety of secondary storage devices 110, such as a hard drive 112 and a removable medium storage device 114. The removable medium storage device 114 may represent, for example, a floppy disk drive, a CD-ROM drive, a magnetic tape drive, *etc.* A removable storage medium 116 (such as a floppy disk, a compact disk, a magnetic tape, *etc.*) containing control logic and/or data recorded therein may be inserted into the removable medium storage device 114. The computer system 102 includes appropriate software for reading the control logic and/or the data from the removable medium storage device 114, once it is inserted into the removable medium storage device 114.

A nucleotide sequence of the present invention may be stored in a well known manner in the main memory 108, any of the secondary storage devices 110, and/or a removable storage medium 116. During execution, software for

accessing and processing the genomic sequence (such as search tools, comparing tools, etc.) reside in main memory 108, in accordance with the requirements and operating parameters of the operating system, the hardware system and the software program or programs.

5 BIOCHEMICAL EMBODIMENTS

Other embodiments of the present invention are directed to fragments of the *Staphylococcus aureus* genome, preferably to isolated fragments. The fragments of the *Staphylococcus aureus* genome of the present invention include, but are not limited to fragments which encode peptides, hereinafter open reading frames (ORFs), fragments which
10 modulate the expression of an operably linked ORF, hereinafter expression modulating fragments (EMFs) and fragments which can be used to diagnose the presence of *Staphylococcus aureus* in a sample, hereinafter diagnostic fragments (DFs).

As used herein, an "isolated nucleic acid molecule" or an "isolated fragment of the *Staphylococcus aureus* genome" refers to a nucleic acid molecule possessing a specific nucleotide sequence which has been subjected to purification
15 means to reduce, from the composition, the number of compounds which are normally associated with the composition. Particularly, the term refers to the nucleic acid molecules having the sequences set out in SEQ ID NOS:1-5,191, to representative fragments thereof as described above, to polynucleotides at least 95%, preferably at least 99% and especially preferably at least 99.9% identical in sequence thereto, also as set out above.

A variety of purification means can be used to generate the isolated fragments of the present invention. These
20 include, but are not limited to methods which separate constituents of a solution based on charge, solubility, or size.

In one embodiment, *Staphylococcus aureus* DNA can be mechanically sheared to produce fragments of 15-20 kb in length. These fragments can then be used to generate an *Staphylococcus aureus* library by inserting them into lambda clones as described in the Examples below. Primers flanking, for example, an ORF, such as those enumerated in Tables 1-3 can then be generated using nucleotide sequence information provided in SEQ ID NOS: 1-5,191. Well
25 known and routine techniques of PCR cloning then can be used to isolate the ORF from the lambda DNA library of *Staphylococcus aureus* genomic DNA. Thus, given the availability of SEQ ID NOS:1-5,191, the information in Tables 1, 2 and 3, and the information that may be obtained readily by analysis of the sequences of SEQ ID NOS:1-5,191 using methods set out above, those of skill will be enabled by the present disclosure to isolate any ORF-containing or other nucleic acid fragment of the present invention.

The isolated nucleic acid molecules of the present invention include, but are not limited to single stranded and double stranded DNA, and single stranded RNA.

As used herein, an "open reading frame," ORF, means a series of triplets coding for amino acids without any termination codons and is a sequence translatable into protein.

Tables 1, 2 and 3 list ORFs in the *Staphylococcus aureus* genomic contigs of the present invention that were
35 identified as putative coding regions by the GeneMark software using organism-specific second-order Markov probability transition matrices. It will be appreciated that other criteria can be used, in accordance with well known analytical methods, such as those discussed herein, to generate more inclusive, more restrictive or more selective lists.

Table 1 sets out ORFs in the *Staphylococcus aureus* contigs of the present invention that are at least 80 amino acids long and over a continuous region of at least 50 bases which are 95% or more identical (by BLAST analysis) to an *S. aureus* nucleotide sequence available through Genbank in November 1996.
40

Table 2 sets out ORFs in the *Staphylococcus aureus* contigs of the present invention that are not in Table 1 and match, with a BLASTP probability score of 0.01 or less, a polypeptide sequence available through Genbank by September 1996.

Table 3 sets out ORFs in the *Staphylococcus aureus* contigs of the present invention that do not match significantly, by BLASTP analysis, a polypeptide sequence available through Genbank by September 1996.
45

In each table, the first and second columns identify the ORF by, respectively, contig number and ORF number within the contig; the third column indicates the reading frame, taking the first 5' nucleotide of the contig as the start of the +1 frame; the fourth column indicates the first nucleotide of the ORF, counting from the 5' end of the contig strand; and the fifth column indicates the length of each ORF in nucleotides.

In Tables 1 and 2, column six, lists the "Reference" for the closest matching sequence available through Genbank. These reference numbers are the databases entry numbers commonly used by those of skill in the art, who will be familiar with their denominators. Descriptions of the nomenclature are available from the National Center for Biotechnology Information. Column seven in Tables 1 and 2 provides the "gene name" of the matching sequence; column eight provides the "BLAST identity" score from the comparison of the ORF and the homologous gene; and column nine
55 indicates the length in nucleotides of the highest scoring segment pair" identified by the BLAST identity analysis.

In Table 3, the last column, column six, indicates the length of each ORF in amino acid residues.

The concepts of percent identity and percent similarity of two polypeptide sequences is well understood in the art. For example, two polypeptides 10 amino acids in length which differ at three amino acid positions (e.g., at positions

1, 3 and 5) are said to have a percent identity of 70%. However, the same two polypeptides would be deemed to have a percent similarity of 80% if, for example at position 5, the amino acids moieties, although not identical, were "similar" (*i.e.*, possessed similar biochemical characteristics). Many programs for analysis of nucleotide or amino acid sequence similarity, such as fasta and BLAST specifically list per cent identity of a matching region as an output parameter. Thus, for instance, Tables 1 and 2 herein enumerate the per cent identity of the highest scoring segment pair in each ORF and its listed relative. Further details concerning the algorithms and criteria used for homology searches are provided below and are described in the pertinent literature highlighted by the citations provided below.

It will be appreciated that other criteria can be used to generate more inclusive and more exclusive listings of the types set out in the tables. As those of skill will appreciate, narrow and broad searches both are useful. Thus, a skilled artisan can readily identify ORFs in contigs of the *Staphylococcus aureus* genome other than those listed in Tables 1-3, such as ORFs which are overlapping or encoded by the opposite strand of an identified ORF in addition to those ascertainable using the computer-based systems of the present invention.

As used herein, an "expression modulating fragment," EMF, means a series of nucleotide molecules which modulates the expression of an operably linked ORF or EMF.

As used herein, a sequence is said to "modulate the expression of an operably linked sequence" when the expression of the sequence is altered by the presence of the EMF. EMFs include, but are not limited to, promoters, and promoter modulating sequences (inducible elements). One class of EMFs are fragments which induce the expression of an operably linked ORF in response to a specific regulatory factor or physiological event.

EMF sequences can be identified within the contigs of the *Staphylococcus aureus* genome by their proximity to the ORFs provided in Tables 1-3. An intergenic segment, or a fragment of the intergenic segment, from about 10 to 200 nucleotides in length, taken from any one of the ORFs of Tables 1-3 will modulate the expression of an operably linked ORF in a fashion similar to that found with the naturally linked ORF sequence. As used herein, an "intergenic segment" refers to fragments of the *Staphylococcus aureus* genome which are between two ORF(s) herein described. EMFs also can be identified using known EMFs as a target sequence or target motif in the computer-based systems of the present invention. Further, the two methods can be combined and used together.

The presence and activity of an EMF can be confirmed using an EMF trap vector. An EMF trap vector contains a cloning site linked to a marker sequence. A marker sequence encodes an identifiable phenotype, such as antibiotic resistance or a complementing nutrition auxotrophic factor, which can be identified or assayed when the EMF trap vector is placed within an appropriate host under appropriate conditions. As described above, a EMF will modulate the expression of an operably linked marker sequence. A more detailed discussion of various marker sequences is provided below.

A sequence which is suspected as being an EMF is cloned in all three reading frames in one or more restriction sites upstream from the marker sequence in the EMF trap vector. The vector is then transformed into an appropriate host using known procedures and the phenotype of the transformed host is examined under appropriate conditions. As described above, an EMF will modulate the expression of an operably linked marker sequence.

As used herein, a "diagnostic fragment," DF, means a series of nucleotide molecules which selectively hybridize to *Staphylococcus aureus* sequences. DFs can be readily identified by identifying unique sequences within contigs of the *Staphylococcus aureus* genome, such as by using well-known computer analysis software, and by generating and testing probes or amplification primers consisting of the DF sequence in an appropriate diagnostic format which determines amplification or hybridization selectivity.

The sequences falling within the scope of the present invention are not limited to the specific sequences herein described, but also include allelic and species variations thereof. Allelic and species variations can be routinely determined by comparing the sequences provided in SEQ ID NOS:1-5,191, a representative fragment thereof, or a nucleotide sequence at least 95%, preferably 99% and most preferably 99.9% identical to SEQ ID NOS:1-5,191, with a sequence from another isolate of the same species.

Furthermore, to accommodate codon variability, the invention includes nucleic acid molecules coding for the same amino acid sequences as do the nucleic acid sequences mentioned above. In other words, in the coding region of an ORF, substitution of one codon for another which encodes the same amino acid is expressly contemplated.

Any specific sequence disclosed herein can be readily screened for errors by resequencing a particular fragment, such as an ORF, in both directions (*i.e.*, sequence both strands). Alternatively, error screening can be performed by sequencing corresponding polynucleotides of *Staphylococcus aureus* origin isolated by using part or all of the fragments in question as a probe or primer.

Each of the ORFs of the *Staphylococcus aureus* genome disclosed in Tables 1, 2 and 3, and the EMFs found 5' to the ORFs, can be used as polynucleotide reagents in numerous ways. For example, the sequences can be used as diagnostic probes or diagnostic amplification primers to detect the presence of a specific microbe in a sample, particular *Staphylococcus aureus*. Especially preferred in this regard are ORF such as those of Table 3, which do not match previously characterized sequences from other organisms and thus are most likely to be highly selective for *Staphylococcus aureus*. Also particularly preferred are ORFs that can be used to distinguish between strains of *Sta-*

phylococcus aureus, particularly those that distinguish medically important strain, such as drug-resistant strains.

In addition, the fragments of the present invention, as broadly described, can be used to control gene expression through triple helix formation or antisense DNA or RNA, both of which methods are based on the binding of a polynucleotide sequence to DNA or RNA. Triple helix-formation optimally results in a shut-off of RNA transcription from DNA, while antisense RNA hybridization blocks translation of an mRNA molecule into polypeptide. Information from the sequences of the present invention can be used to design antisense and triple helix-forming oligonucleotides. Polynucleotides suitable for use in these methods are usually 20 to 40 bases in length and are designed to be complementary to a region of the gene involved in transcription, for triple-helix formation, or to the mRNA itself, for antisense inhibition. Both techniques have been demonstrated to be effective in model systems, and the requisite techniques are well known and involve routine procedures. Triple helix techniques are discussed in, for example, Lee *et al.*, *Nucl. Acids Res.* **6**: 3073 (1979); Cooney *et al.*, *Science* **241**: 456 (1988); and Dervan *et al.*, *Science* **251**: 1360 (1991). Antisense techniques in general are discussed in, for instance, Okano, *J. Neurochem.* **56**: 560 (1991) and OLIGODEOXYNUCLEOTIDES AS ANTISENSE INHIBITORS OF GENE EXPRESSION, CRC Press, Boca Raton, FL (1988)).

The present invention further provides recombinant constructs comprising one or more fragments of the *Staphylococcus aureus* genomic fragments and contigs of the present invention. Certain preferred recombinant constructs of the present invention comprise a vector, such as a plasmid or viral vector, into which a fragment of the *Staphylococcus aureus* genome has been inserted, in a forward or reverse orientation. In the case of a vector comprising one of the ORFs of the present invention, the vector may further comprise regulatory sequences, including for example, a promoter, operably linked to the ORF. For vectors comprising the EMFs of the present invention, the vector may further comprise a marker sequence or heterologous ORF operably linked to the EMF.

Large numbers of suitable vectors and promoters are known to those of skill in the art and are commercially available for generating the recombinant constructs of the present invention. The following vectors are provided by way of example. Useful bacterial vectors include phagescript, PsiX174, pBluescript SK and KS (+ and -), pNH8a, pNH16a, pNH18a, pNH46a (available from Stratagene); pTrc99A, pKK223-3, pKK233-3, pDF540, pRIT5 (available from Pharmacia). Useful eukaryotic vectors include pWLneo, pSV2cat, pOG44, pXT1, pSG (available from Stratagene) pSVK3, pBPV, pMSG, pSVL (available from Pharmacia).

Promoter regions can be selected from any desired gene using CAT (chloramphenicol transferase) vectors or other vectors with selectable markers. Two appropriate vectors are pKK232-8 and pCM7. Particular named bacterial promoters include lacI, lacZ, T3, T7, gpt, lambda PR, and trc. Eukaryotic promoters include CMV immediate early, HSV thymidine kinase, early and late SV40, LTRs from retrovirus, and mouse metallothionein-I. Selection of the appropriate vector and promoter is well within the level of ordinary skill in the art.

The present invention further provides host cells containing any one of the isolated fragments of the *Staphylococcus aureus* genomic fragments and contigs of the present invention, wherein the fragment has been introduced into the host cell using known methods. The host cell can be a higher eukaryotic host cell, such as a mammalian cell, a lower eukaryotic host cell, such as a yeast cell, or a procaryotic cell, such as a bacterial cell.

A polynucleotide of the present invention, such as a recombinant construct comprising an ORF of the present invention, may be introduced into the host by a variety of well established techniques that are standard in the art, such as calcium phosphate transfection, DEAE, dextran mediated transfection and electroporation, which are described in, for instance, Davis, L. *et al.*, BASIC METHODS IN MOLECULAR BIOLOGY (1986).

A host cell containing one of the fragments of the *Staphylococcus aureus* genomic fragments and contigs of the present invention, can be used in conventional manners to produce the gene product encoded by the isolated fragment (in the case of an ORF) or can be used to produce a heterologous protein under the control of the EMF.

The present invention further provides isolated polypeptides encoded by the nucleic acid fragments of the present invention or by degenerate variants of the nucleic acid fragments of the present invention. By "degenerate variant" is intended nucleotide fragments which differ from a nucleic acid fragment of the present invention (e.g., an ORF) by nucleotide sequence but, due to the degeneracy of the Genetic Code, encode an identical polypeptide sequence.

Preferred nucleic acid fragments of the present invention are the ORFs depicted in Tables 2 and 3 which encode proteins.

A variety of methodologies known in the art can be utilized to obtain any one of the isolated polypeptides or proteins of the present invention. At the simplest level, the amino acid sequence can be synthesized using commercially available peptide synthesizers. This is particularly useful in producing small peptides and fragments of larger polypeptides. Such short fragments as may be obtained most readily by synthesis are useful, for example, in generating antibodies against the native polypeptide, as discussed further below.

In an alternative method, the polypeptide or protein is purified from bacterial cells which naturally produce the polypeptide or protein. One skilled in the art can readily employ well-known methods for isolating polypeptides and proteins to isolate and purify polypeptides or proteins of the present invention produced naturally by a bacterial strain, or by other methods. Methods for isolation and purification that can be employed in this regard include, but are not limited to, immunochromatography, HPLC, size-exclusion chromatography, ion-exchange chromatography, and immu-

no-affinity chromatography.

The polypeptides and proteins of the present invention also can be purified from cells which have been altered to express the desired polypeptide or protein. As used herein, a cell is said to be altered to express a desired polypeptide or protein when the cell, through genetic manipulation, is made to produce a polypeptide or protein which it normally does not produce or which the cell normally produces at a lower level. Those skilled in the art can readily adapt procedures for introducing and expressing either recombinant or synthetic sequences into eukaryotic or prokaryotic cells in order to generate a cell which produces one of the polypeptides or proteins of the present invention.

Any host/vector system can be used to express one or more of the ORFs of the present invention. These include, but are not limited to, eukaryotic hosts such as HeLa cells, CV-1 cell, COS cells, and S19 cells, as well as prokaryotic host such as *E. coli* and *B. subtilis*. The most preferred cells are those which do not normally express the particular polypeptide or protein or which expresses the polypeptide or protein at low natural level.

"Recombinant," as used herein, means that a polypeptide or protein is derived from recombinant (e.g., microbial or mammalian) expression systems. "Microbial" refers to recombinant polypeptides or proteins made in bacterial or fungal (e.g., yeast) expression systems. As a product, "recombinant microbial" defines a polypeptide or protein essentially free of native endogenous substances and unaccompanied by associated native glycosylation. Polypeptides or proteins expressed in most bacterial cultures, e.g., *E. coli*, will be free of glycosylation modifications; polypeptides or proteins expressed in yeast will have a glycosylation pattern different from that expressed in mammalian cells.

"Nucleotide sequence" refers to a heteropolymer of deoxyribonucleotides. Generally, DNA segments encoding the polypeptides and proteins provided by this invention are assembled from fragments of the *Staphylococcus aureus* genome and short oligonucleotide linkers, or from a series of oligonucleotides, to provide a synthetic gene which is capable of being expressed in a recombinant transcriptional unit comprising regulatory elements derived from a microbial or viral operon.

"Recombinant expression vehicle or vector" refers to a plasmid or phage or virus or vector, for expressing a polypeptide from a DNA (RNA) sequence. The expression vehicle can comprise a transcriptional unit comprising an assembly of (1) a genetic regulatory elements necessary for gene expression in the host, including elements required to initiate and maintain transcription at a level sufficient for suitable expression of the desired polypeptide, including, for example, promoters and, where necessary, an enhancers and a polyadenylation signal; (2) a structural or coding sequence which is transcribed into mRNA and translated into protein, and (3) appropriate signals to initiate translation at the beginning of the desired coding region and terminate translation at its end. Structural units intended for use in yeast or eukaryotic expression systems preferably include a leader sequence enabling extracellular secretion of translated protein by a host cell. Alternatively, where recombinant protein is expressed without a leader or transport sequence, it may include an N-terminal methionine residue. This residue may or may not be subsequently cleaved from the expressed recombinant protein to provide a final product.

"Recombinant expression system" means host cells which have stably integrated a recombinant transcriptional unit into chromosomal DNA or carry the recombinant transcriptional unit extra chromosomally. The cells can be prokaryotic or eukaryotic. Recombinant expression systems as defined herein will express heterologous polypeptides or proteins upon induction of the regulatory elements linked to the DNA segment or synthetic gene to be expressed.

Mature proteins can be expressed in mammalian cells, yeast, bacteria, or other cells under the control of appropriate promoters. Cell-free translation systems can also be employed to produce such proteins using RNAs derived from the DNA constructs of the present invention. Appropriate cloning and expression vectors for use with prokaryotic and eukaryotic hosts are described in Sambrook *et al.*, MOLECULAR CLONING: A LABORATORY MANUAL, 2nd Edition, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York (1989), the disclosure of which is hereby incorporated by reference in its entirety.

Generally, recombinant expression vectors will include origins of replication and selectable markers permitting transformation of the host cell, e.g., the ampicillin resistance gene of *E. coli* and *S. cerevisiae* TRP1 gene, and a promoter derived from a highly expressed gene to direct transcription of a downstream structural sequence. Such promoters can be derived from operons encoding glycolytic enzymes such as 3-phosphoglycerate kinase (PGK), alpha-factor, acid phosphatase, or heat shock proteins, among others. The heterologous structural sequence is assembled in appropriate phase with translation initiation and termination sequences, and preferably, a leader sequence capable of directing secretion of translated protein into the periplasmic space or extracellular medium. Optionally, the heterologous sequence can encode a fusion protein including an N-terminal identification peptide imparting desired characteristics, e.g., stabilization or simplified purification of expressed recombinant product.

Useful expression vectors for bacterial use are constructed by inserting a structural DNA sequence encoding a desired protein together with suitable translation initiation and termination signals in operable reading phase with a functional promoter. The vector will comprise one or more phenotypic selectable markers and an origin of replication to ensure maintenance of the vector and, when desirable, provide amplification within the host.

Suitable prokaryotic hosts for transformation include strains of *Staphylococcus aureus*, *E. coli*, *B. subtilis*, *Salmonella typhimurium* and various species within the genera *Pseudomonas*, *Streptomyces*, and *Staphylococcus*. Others

may, also be employed as a matter of choice.

As a representative but non-limiting example, useful expression vectors for bacterial use can comprise a selectable marker and bacterial origin of replication derived from commercially available plasmids comprising genetic elements of the well known cloning vector pBR322 (ATCC 37017). Such commercial vectors include, for example, pKK223-3 (available from Pharmacia Fine Chemicals, Uppsala, Sweden) and GEM 1 (available from Promega Biotec, Madison, WI, USA). These pBR322 "backbone" sections are combined with an appropriate promoter and the structural sequence to be expressed.

Following transformation of a suitable host strain and growth of the host strain to an appropriate cell density, the selected promoter, where it is inducible, is derepressed or induced by appropriate means (e.g., temperature shift or chemical induction) and cells are cultured for an additional period to provide for expression of the induced gene product. Thereafter cells are typically harvested, generally by centrifugation, disrupted to release expressed protein, generally by physical or chemical means, and the resulting crude extract is retained for further purification.

Various mammalian cell culture systems can also be employed to express recombinant protein. Examples of mammalian expression systems include the COS-7 lines of monkey kidney fibroblasts, described in Gluzman, *Cell* 23: 175 (1981), and other cell lines capable of expressing a compatible vector, for example, the C127, 3T3, CHO, HeLa and BHK cell lines.

Mammalian expression vectors will comprise an origin of replication, a suitable promoter and enhancer, and also any necessary ribosome binding sites, polyadenylation site, splice donor and acceptor sites, transcriptional termination sequences, and 5' flanking nontranscribed sequences. DNA sequences derived from the SV40 viral genome, for example, SV40 origin, early promoter, enhancer, splice, and polyadenylation sites may be used to provide the required nontranscribed genetic elements.

Recombinant polypeptides and proteins produced in bacterial culture is usually isolated by initial extraction from cell pellets, followed by one or more salting-out, aqueous ion exchange or size exclusion chromatography steps. Microbial cells employed in expression of proteins can be disrupted by any convenient method, including freeze-thaw cycling, sonication, mechanical disruption, or use of cell lysing agents. Protein refolding steps can be used, as necessary, in completing configuration of the mature protein. Finally, high performance liquid chromatography (HPLC) can be employed for final purification steps.

An additional aspect of the invention includes *Staphylococcus aureus* polypeptides which are useful as immunodiagnostic antigens and/or immunoprotective vaccines, collectively "immunologically useful polypeptides". Such immunologically useful polypeptides may be selected from the ORFs disclosed herein based on techniques well known in the art and described elsewhere herein. The inventors have used the following criteria to select several immunologically useful polypeptides:

As is known in the art, an amino terminal type I signal sequence directs a nascent protein across the plasma and outer membranes to the exterior of the bacterial cell. Such outer membrane polypeptides are expected to be immunologically useful. According to Izard, J. W. et al., *Mol. Microbiol.* 13, 765-773; (1994), polypeptides containing type I signal sequences contain the following physical attributes: The length of the type I signal sequence is approximately 15 to 25 primarily hydrophobic amino acid residues with a net positive charge in the extreme amino terminus; the central region of the signal sequence must adopt an alpha-helical conformation in a hydrophobic environment; and the region surrounding the actual site of cleavage is ideally six residues long, with small side-chain amino acids in the -1 and -3 positions.

Also known in the art is the type IV signal sequence which is an example of the several types of functional signal sequences which exist in addition to the type I signal sequence detailed above. Although functionally related, the type IV signal sequence possesses a unique set of biochemical and physical attributes (Strom, M. S. and Lory, S., *J. Bacteriol.* 174, 7345-7351; 1992). These are typically six to eight amino acids with a net basic charge followed by an additional sixteen to thirty primarily hydrophobic residues. The cleavage site of a type IV signal sequence is typically after the initial six to eight amino acids at the extreme amino terminus. In addition, all type IV signal sequences contain a phenylalanine residue at the +1 site relative to the cleavage site.

Studies of the cleavage sites of twenty-six bacterial lipoprotein precursors has allowed the definition of a consensus amino acid sequence for lipoprotein cleavage. Nearly three-fourths of the bacterial lipoprotein precursors examined contained the sequence L-(A,S)-(G,A)-C at positions -3 to +1, relative to the point of cleavage (Hayashi, S. and Wu, H. C. *Lipoproteins in bacteria*. *J. Bioenerg. Biomembr.* 22, 451-471; 1990).

It well known that most anchored proteins found on the surface of gram-positive bacteria possess a highly conserved carboxy terminal sequence. More than fifty such proteins from organisms such as *S. pyogenes*, *S. mutans*, *E. faecalis*, *S. pneumoniae*, and others, have been identified based on their extracellular location and carboxy terminal amino acid sequence (Fischetti, V. A. *Gram-positive commensal bacteria deliver antigens to elicit mucosal and systemic immunity*. *ASM News* 62, 405410; 1996). The conserved region is comprised of six charged amino acids at the extreme carboxy terminus coupled to 15-20 hydrophobic amino acids presumed to function as a transmembrane domain. Immediately adjacent to the transmembrane domain is a six amino acid sequence conserved in nearly all proteins ex-

aminated. The amino acid sequence of this region is L-P-X-T-G-X, where X is any amino acid.

Amino acid sequence similarities to proteins of known function by BLAST enables the assignment of putative functions to novel amino acid sequences and allows for the selection of proteins thought to function outside the cell wall. Such proteins are well known in the art and include "lipoprotein", "periplasmic", or "antigen".

5 An algorithm for selecting antigenic and immunogenic *Staphylococcus aureus* polypeptides including the foregoing criteria was developed by the present inventors. Use of the algorithm by the inventors to select immunologically useful *Staphylococcus aureus* polypeptides resulted in the selection of several ORFs which are predicted to be outermembrane-associated proteins. These proteins are identified in Table 4, below, and shown in the Sequence Listing as SEQ ID NOS:5,192 to 5,255. Thus the amino acid sequence of each of several antigenic *Staphylococcus aureus* polypeptides
10 listed in Table 4 can be determined, for example, by locating the amino acid sequence of the ORF in the Sequence Listing. Likewise the polynucleotide sequence encoding each ORF can be found by locating the corresponding polynucleotide SEQ ID in Tables 1, 2, or 3, and finding the corresponding nucleotide sequence in the sequence listing.

As will be appreciated by those of ordinary skill in the art, although a polypeptide representing an entire ORF may be the closest approximation to a protein found *in vivo*, it is not always technically practical to express a complete ORF
15 *in vitro*. It may be very challenging to express and purify a highly hydrophobic protein by common laboratory methods. As a result, the immunologically useful polypeptides described herein as SEQ ID NOS:5,192-5,255 may have been modified slightly to simplify the production of recombinant protein, and are the preferred embodiments. In general, nucleotide sequences which encode highly hydrophobic domains, such as those found at the amino terminal signal sequence, are excluded for enhanced *in vitro* expression of the polypeptides. Furthermore, any highly hydrophobic
20 amino acid sequences occurring at the carboxy terminus are also excluded. Such truncated polypeptides include for example the mature forms of the polypeptides expected to exist in nature.

Those of ordinary skill in the art can identify soluble portions the polypeptide identified in Table 4, and in the case of truncated polypeptides sequences shown as SEQ ID NOS:5,192-5,255, may obtain the complete predicted amino acid sequence of each polypeptide by translating the corresponding polynucleotides sequences of the corresponding
25 ORF listed in Tables 1,2 and 3 and found in the sequence listing.

Accordingly, polypeptides comprising the complete amino acid of an immunologically useful polypeptide selected from the group of polypeptides encoded by the ORFs identified in Table 4, or an amino acid sequence at least 95% identical thereto, preferably at least 97% identical thereto, and most preferably at least 99% identical thereto form an embodiment of the invention; in addition polypeptides comprising an amino acid sequence selected from the group of
30 amino acid sequences shown in the sequence listing as SEQ ID NOS:5,191-5,255, or an amino acid sequence at least 95% identical thereto, preferably at least 97% identical thereto and most preferably at least 99% identical thereto, form an embodiment of the invention. Polynucleotides encoding the foregoing polypeptides also form part of the present invention.

In another aspect, the invention provides a peptide or polypeptide comprising an epitope-bearing portion of a polypeptide of the invention, particularly those epitope-bearing portions (antigenic regions) identified in Table 4. The epitope-bearing portion is an immunogenic or antigenic epitope of a polypeptide of the invention. An "immunogenic epitope" is defined as a part of a protein that elicits an antibody response when the whole protein is the immunogen. On the other hand, a region of a protein molecule to which an antibody can bind is defined as an "antigenic epitope." The number of immunogenic epitopes of a protein generally is less than the number of antigenic epitopes. See, for instance, Geysen et al., Proc. Natl. Acad. Sci. USA 81:3998-4002 (1983).
40

As to the selection of peptides or polypeptides bearing an antigenic epitope (i.e., that contain a region of a protein molecule to which an antibody can bind), it is well known in that art that relatively short synthetic peptides that mimic part of a protein sequence are routinely capable of eliciting an antiserum that reacts with the partially mimicked protein. See, for instance, Sutcliffe, J. G., Shinnick, T. M., Green, N. and Learner, R. A. (1983) "Antibodies that react with predetermined sites on proteins", Science, 219:660-666. Peptides capable of eliciting protein-reactive sera are frequently represented in the primary sequence of a protein, can be characterized by a set of simple chemical rules, and are confined neither to immunodominant regions of intact proteins (i.e., immunogenic epitopes) nor to the amino or carboxyl terminals. Antigenic epitope-bearing peptides and polypeptides of the invention are therefore useful to raise antibodies, including monoclonal antibodies, that bind specifically to a polypeptide of the invention. See, for instance,
50 Wilson et al., Cell 37:767-778 (1984) at 777.

Antigenic epitope-bearing peptides and polypeptides of the invention preferably contain a sequence of at least seven, more preferably at least nine and most preferably between about 15 to about 30 amino acids contained within the amino acid sequence of a polypeptide of the invention. Non-limiting examples of antigenic polypeptides or peptides that can be used to generate *S. aureus* specific antibodies include: a polypeptide comprising peptides shown in Table
55 4 below. These polypeptide fragments have been determined to bear antigenic epitopes of indicated *S. aureus* proteins by the analysis of the Jameson-Wolf antigenic index, a representative sample of which is shown in Figure 3.

The epitope-bearing peptides and polypeptides of the invention may be produced by any conventional means. See, e.g., Houghten, R. A. (1985) General method for the rapid solid-phase synthesis of large numbers of peptides:

specificity of antigen-antibody interaction at the level of individual amino acids. Proc. Natl. Acad. Sci. USA 82: 5131-5135; this "Simultaneous Multiple Peptide Synthesis (SMPS)" process is further described in U.S. Patent No. 4,631,211 to Houghten et al. (1986). Epitope-bearing peptides and polypeptides of the invention are used to induce antibodies according to methods well known in the art. See, for instance, Sutcliffe et al., supra; Wilson et al., supra; Chow, M. et al., Proc. Natl. Acad. Sci. USA 82:910-914; and Bittle, F. J. et al., J. Gen. Virol. 66:2347-2354 (1985).

Immunogenic epitope-bearing peptides of the invention, i.e., those parts of a protein that elicit an antibody response when the whole protein is the immunogen, are identified according to methods known in the art. See, for instance, Geysen et al., supra. Further still, U.S. Patent No. 5,194,392 to Geysen (1990) describes a general method of detecting or determining the sequence of monomers (amino acids or other compounds) which is a topological equivalent of the epitope (i.e., a "mimotope") which is complementary to a particular paratope (antigen binding site) of an antibody of interest. More generally, U.S. Patent No. 4,433,092 to Geysen (1989) describes a method of detecting or determining a sequence of monomers which is a topographical equivalent of a ligand which is complementary to the ligand binding site of a particular receptor of interest. Similarly, U.S. Patent No. 5,480,971 to Houghten, R. A. et al. (1996) on Per-alkylated Oligopeptide Mixtures discloses linear C1-C7-alkyl peralkylated oligopeptides and sets and libraries of such peptides, as well as methods for using such oligopeptide sets and libraries for determining the sequence of a per-alkylated oligopeptide that preferentially binds to an acceptor molecule of interest. Thus, non-peptide analogs of the epitope-bearing peptides of the invention also can be made routinely by these methods.

Table 4 lists immunologically useful polypeptides identified by an algorithm which locates novel *Staphylococcus aureus* outermembrane proteins, as is described above. Also listed are epitopes or "antigenic regions" of each of the identified polypeptides. The antigenic regions, or epitopes, are delineated by two numbers x-y, where x is the number of the first amino acid in the open reading frame included within the epitope and y is the number of the last amino acid in the open reading frame included within the epitope. For example, the first epitope in ORF 168-6 is comprised of amino acids 36 to 45 of SEQ ID NO:5,192, as is described in Table 4. The inventors have identified several epitopes for each of the antigenic polypeptides identified in Table 4. Accordingly, forming part of the present invention are polypeptides comprising an amino acid sequence of one or more antigenic regions identified in Table 4. The invention further provides polynucleotides encoding such polypeptides.

The present invention further includes isolated polypeptides, proteins and nucleic acid molecules which are substantially equivalent to those herein described. As used herein, substantially equivalent can refer both to nucleic acid and amino acid sequences, for example a mutant sequence, that varies from a reference sequence by one or more substitutions, deletions, or additions, the net effect of which does not result in an adverse functional dissimilarity between reference and subject sequences. For purposes of the present invention, sequences having equivalent biological activity, and equivalent expression characteristics are considered substantially equivalent. For purposes of determining equivalence, truncation of the mature sequence should be disregarded.

The invention further provides methods of obtaining homologs from other strains of *Staphylococcus aureus*, of the fragments of the *Staphylococcus aureus* genome of the present invention and homologs of the proteins encoded by the ORFs of the present invention. As used herein, a sequence or protein of *Staphylococcus aureus* is defined as a homolog of a fragment of the *Staphylococcus aureus* fragments or contigs or a protein encoded by one of the ORFs of the present invention, if it shares significant homology to one of the fragments of the *Staphylococcus aureus* genome of the present invention or a protein encoded by one of the ORFs of the present invention. Specifically, by using the sequence disclosed herein as a probe or as primers, and techniques such as PCR cloning and colony/plaque hybridization, one skilled in the art can obtain homologs.

As used herein, two nucleic acid molecules or proteins are said to "share significant homology" if the two contain regions which possess greater than 85% sequence (amino acid or nucleic acid) homology. Preferred homologs in this regard are those with more than 90% homology. Especially preferred are those with 93% or more homology. Among especially preferred homologs those with 95% or more homology are particularly preferred. Very particularly preferred among these are those with 97% and even more particularly preferred among these are homologs with 99% or more homology. The most preferred homologs among these are those with 99.9% homology or more. It will be understood that, among measures of homology, identity is particularly preferred in this regard.

Region specific primers or probes derived from the nucleotide sequence provided in SEQ ID NOS:1-5,191 or from a nucleotide sequence at least 95%, particularly at least 99%, especially at least 99.5% identical to a sequence of SEQ ID NOS:1-5,191 can be used to prime DNA synthesis and PCR amplification, as well as to identify colonies containing cloned DNA encoding a homolog. Methods suitable to this aspect of the present invention are well known and have been described in great detail in many publications such as, for example, Innis et al., PCR PROTOCOLS, Academic Press, San Diego, CA (1990)).

When using primers derived from SEQ ID NOS:1-5,191 or from a nucleotide sequence having an aforementioned identity to a sequence of SEQ ID NOS:1-5,191, one skilled in the art will recognize that by employing high stringency conditions (e.g., annealing at 50-60°C in 6X SSPE and 50% formamide, and washing at 50-65°C in 0.5X SSPE) only sequences which are greater than 75% homologous to the primer will be amplified. By employing lower stringency

conditions (e.g., hybridizing at 35-37°C in 5X SSPC and 40-45% formamide, and washing at 42°C in 0.5X SSPC), sequences which are greater than 40-50% homologous to the primer will also be amplified.

When using DNA probes derived from SEQ ID NOS:1-5,191, or from a nucleotide sequence having an aforementioned identity to a sequence of SEQ ID NOS:1-5,191, for colony/plaque hybridization, one skilled in the art will recognize that by employing high stringency conditions (e.g., hybridizing at 50-65°C in 5X SSPC and 50% formamide, and washing at 50-65°C in 0.5X SSPC), sequences having regions which are greater than 90% homologous to the probe can be obtained, and that by employing lower stringency conditions (e.g., hybridizing at 35-37°C in 5X SSPC and 40-45% formamide, and washing at 42°C in 0.5X SSPC), sequences having regions which are greater than 35-45% homologous to the probe will be obtained.

Any organism can be used as the source for homologs of the present invention so long as the organism naturally expresses such a protein or contains genes encoding the same. The most preferred organism for isolating homologs are bacterias which are closely related to *Staphylococcus aureus*.

ILLUSTRATIVE USES OF COMPOSITIONS OF THE INVENTION

Each ORF provided in Tables 1 and 2 is identified with a function by homology to a known gene or polypeptide. As a result, one skilled in the art can use the polypeptides of the present invention for commercial, therapeutic and industrial purposes consistent with the type of putative identification of the polypeptide. Such identifications permit one skilled in the art to use the *Staphylococcus aureus* ORFs in a manner similar to the known type of sequences for which the identification is made; for example, to ferment a particular sugar source or to produce a particular metabolite. A variety of reviews illustrative of this aspect of the invention are available, including the following reviews on the industrial use of enzymes, for example, BIOCHEMICAL ENGINEERING AND BIOTECHNOLOGY HANDBOOK, 2nd Ed., Macmillan Publications, Ltd. NY (1991) and BIOCATALYSTS IN ORGANIC SYNTHESIS, Trumper *et al.*, Eds., Elsevier Science Publishers, Amsterdam, The Netherlands (1985). A variety of exemplary uses that illustrate this and similar aspects of the present invention are discussed below.

1. Biosynthetic Enzymes

Open reading frames encoding proteins involved in mediating the catalytic reactions involved in intermediary and macromolecular metabolism, the biosynthesis of small molecules, cellular processes and other functions includes enzymes involved in the degradation of the intermediary products of metabolism, enzymes involved in central intermediary metabolism, enzymes involved in respiration, both aerobic and anaerobic, enzymes involved in fermentation, enzymes involved in ATP proton motor force conversion, enzymes involved in broad regulatory function, enzymes involved in amino acid synthesis, enzymes involved in nucleotide synthesis, enzymes involved in cofactor and vitamin synthesis, can be used for industrial biosynthesis.

The various metabolic pathways present in *Staphylococcus aureus* can be identified based on absolute nutritional requirements as well as by examining the various enzymes identified in Table 1-3 and SEQ ID NOS:1-5,191.

Of particular interest are polypeptides involved in the degradation of intermediary metabolites as well as non-macromolecular metabolism. Such enzymes include amylases, glucose oxidases, and catalase.

Proteolytic enzymes are another class of commercially important enzymes. Proteolytic enzymes find use in a number of industrial processes including the processing of flax and other vegetable fibers, in the extraction, clarification and depectinization of fruit juices, in the extraction of vegetables' oil and in the maceration of fruits and vegetables to give unicellular fruits. A detailed review of the proteolytic enzymes used in the food industry is provided in Rombouts *et al.*, *Symbiosis* 21: 79 (1986) and Voragen *et al.* in BIOCATALYSTS IN AGRICULTURAL BIOTECHNOLOGY, Whitaker *et al.*, Eds., *American Chemical Society Symposium Series* 389: 93 (1989).

The metabolism of sugars is an important aspect of the primary metabolism of *Staphylococcus aureus*. Enzymes involved in the degradation of sugars, such as, particularly, glucose, galactose, fructose and xylose, can be used in industrial fermentation. Some of the important sugar transforming enzymes, from a commercial viewpoint, include sugar isomerases such as glucose isomerase. Other metabolic enzymes have found commercial use such as glucose oxidases which produces ketogulonic acid (KGA). KGA is an intermediate in the commercial production of ascorbic acid using the Reichstein's procedure, as described in Krueger *et al.*, *Biotechnology* 6(A), Rhine *et al.*, Eds., Verlag Press, Weinheim, Germany (1984).

Glucose oxidase (GOD) is commercially available and has been used in purified form as well as in an immobilized form for the deoxygenation of beer. See, for instance, Hartmeir *et al.*, *Biotechnology Letters* 1: 21 (1979). The most important application of GOD is the industrial scale fermentation of gluconic acid. Market for gluconic acids which are used in the detergent, textile, leather, photographic, pharmaceutical, food, feed and concrete industry, as described, for example, in Bigelis *et al.*, beginning on page 357 in GENE MANIPULATIONS AND FUNGI; Benett *et al.*, Eds., Academic Press, New York (1985). In addition to industrial applications, GOD has found applications in medicine for

quantitative determination of glucose in body fluids recently in biotechnology for analyzing syrups from starch and cellulose hydrosylates. This application is described in Owusu *et al.*, *Biochem. et Biophysica. Acta* 872: 83 (1986), for instance.

The main sweetener used in the world today is sugar which comes from sugar beets and sugar cane. In the field of industrial enzymes, the glucose isomerase process shows the largest expansion in the market today. Initially, soluble enzymes were used and later immobilized enzymes were developed (Krueger *et al.*, *Biotechnology, The Textbook of Industrial Microbiology*, Sinauer Associated Incorporated, Sunderland, Massachusetts (1990)). Today, the use of glucose- produced high fructose syrups is by far the largest industrial business using immobilized enzymes. A review of the industrial use of these enzymes is provided by Jorgensen, *Starch* 40:307 (1988).

Proteinases, such as alkaline serine proteinases, are used as detergent additives and thus represent one of the largest volumes of microbial enzymes used in the industrial sector. Because of their industrial importance, there is a large body of published and unpublished information regarding the use of these enzymes in industrial processes. (See Faultman *et al.*, *Acid Proteases Structure Function and Biology*, Tang, J., ed., Plenum Press, New York (1977) and Godfrey *et al.*, *Industrial Enzymes*, MacMillan Publishers, Surrey, UK (1983) and Hepner *et al.*, *Report Industrial Enzymes* by 1990, Hel Hepner & Associates, London (1986)).

Another class of commercially usable proteins of the present invention are the microbial lipases, described by, for instance, Macrae *et al.*, *Philosophical Transactions of the Chiral Society of London* 310:227 (1985) and Poserke, *Journal of the American Oil Chemist Society* 61:1758 (1984). A major use of lipases is in the fat and oil industry for the production of neutral glycerides using lipase catalyzed inter-esterification of readily available triglycerides. Application of lipases include the use as a detergent additive to facilitate the removal of fats from fabrics in the course of the washing procedures.

The use of enzymes, and in particular microbial enzymes, as catalyst for key steps in the synthesis of complex organic molecules is gaining popularity at a great rate. One area of great interest is the preparation of chiral intermediates. Preparation of chiral intermediates is of interest to a wide range of synthetic chemists particularly those scientists involved with the preparation of new pharmaceuticals, agrochemicals, fragrances and flavors. (See Davies *et al.*, *Recent Advances in the Generation of Chiral Intermediates Using Enzymes*, CRC Press, Boca Raton, Florida (1990)). The following reactions catalyzed by enzymes are of interest to organic chemists: hydrolysis of carboxylic acid esters, phosphate esters, amides and nitriles, esterification reactions, trans-esterification reactions, synthesis of amides, reduction of alkanones and oxoalkanates, oxidation of alcohols to carbonyl compounds, oxidation of sulfides to sulfoxides, and carbon bond forming reactions such as the aldol reaction.

When considering the use of an enzyme encoded by one of the ORFs of the present invention for biotransformation and organic synthesis it is sometimes necessary to consider the respective advantages and disadvantages of using a microorganism as opposed to an isolated enzyme. Pros and cons of using a whole cell system on the one hand or an isolated partially purified enzyme on the other hand, has been described in detail by Bud *et al.*, *Chemistry in Britain* (1987), p. 127.

Amino transferases, enzymes involved in the biosynthesis and metabolism of amino acids, are useful in the catalytic production of amino acids. The advantages of using microbial based enzyme systems is that the amino transferase enzymes catalyze the stereo- selective synthesis of only L-amino acids and generally possess uniformly high catalytic rates. A description of the use of amino transferases for amino acid production is provided by Roselle-David, *Methods of Enzymology* 136:479 (1987).

Another category of useful proteins encoded by the ORFs of the present invention include enzymes involved in nucleic acid synthesis, repair, and recombination. A variety of commercially important enzymes have previously been isolated from members of *Staphylococcus aureus*. These include Sau3A and Sau96I.

2. Generation of Antibodies

As described here, the proteins of the present invention, as well as homologs thereof, can be used in a variety of procedures and methods known in the art which are currently applied to other proteins. The proteins of the present invention can further be used to generate an antibody which selectively binds the protein. Such antibodies can be either monoclonal or polyclonal antibodies, as well fragments of these antibodies, and humanized forms.

The invention further provides antibodies which selectively bind to one of the proteins of the present invention and hybridomas which produce these antibodies. A hybridoma is an immortalized cell line which is capable of secreting a specific monoclonal antibody.

In general, techniques for preparing polyclonal and monoclonal antibodies as well as hybridomas capable of producing the desired antibody are well known in the art (Campbell, A. M., *MONOCLONAL ANTIBODY TECHNOLOGY: LABORATORY TECHNIQUES IN BIOCHEMISTRY AND MOLECULAR BIOLOGY*, Elsevier Science Publishers, Amsterdam, The Netherlands (1984); St. Groth *et al.*, *J. Immunol. Methods* 35: 1-21 (1980), Kohler and Milstein, *Nature* 256: 495-497 (1975)), the trioma technique, the human B- cell hybridoma technique (Kozbor *et al.*, *Immunology Today*

4: 72 (1983), pgs. 77-96 of Cole *et al.*, in MONOCLONAL ANTIBODIES AND CANCER THERAPY, Alan R. Liss, Inc. (1985)).

Any animal (mouse, rabbit, *etc.*) which is known to produce antibodies can be immunized with the pseudogene polypeptide. Methods for immunization are well known in the art. Such methods include subcutaneous or interperitoneal injection of the polypeptide. One skilled in the art will recognize that the amount of the protein encoded by the ORF of the present invention used for immunization will vary based on the animal which is immunized, the antigenicity of the peptide and the site of injection.

The protein which is used as an immunogen may be modified or administered in an adjuvant in order to increase the protein's antigenicity. Methods of increasing the antigenicity of a protein are well known in the art and include, but are not limited to coupling the antigen with a heterologous protein (such as globulin or galactosidase) or through the inclusion of an adjuvant during immunization.

For monoclonal antibodies, spleen cells from the immunized animals are removed, fused with myeloma cells, such as SP2/O-Ag14 myeloma cells, and allowed to become monoclonal antibody producing hybridoma cells.

Any one of a number of methods well known in the art can be used to identify the hybridoma cell which produces an antibody with the desired characteristics. These include screening the hybridomas with an ELISA assay, western blot analysis, or radioimmunoassay (Lutz *et al.*, *Exp. Cell Res.* 175: 109-124 (1988)).

Hybridomas secreting the desired antibodies are cloned and the class and subclass is determined using procedures known in the art (Campbell, A. M., *Monoclonal Antibody Technology: Laboratory Techniques in Biochemistry and Molecular Biology*, Elsevier Science Publishers, Amsterdam, The Netherlands (1984)).

Techniques described for the production of single chain antibodies (U. S. Patent 4,946,778) can be adapted to produce single chain antibodies to proteins of the present invention.

For polyclonal antibodies, antibody containing antisera is isolated from the immunized animal and is screened for the presence of antibodies with the desired specificity using one of the above-described procedures.

The present invention further provides the above-described antibodies in detectably labelled form. Antibodies can be detectably labelled through the use of radioisotopes, affinity labels (such as biotin, avidin, *etc.*), enzymatic labels (such as horseradish peroxidase, alkaline phosphatase, *etc.*) fluorescent labels (such as FITC or rhodamine, *etc.*), paramagnetic atoms, *etc.* Procedures for accomplishing such labelling are well-known in the art, for example see Sternberger *et al.*, *J. Histochem. Cytochem.* 18:315 (1970); Bayer, E. A. *et al.*, *Meth. Enzym.* 62:308 (1979); Engval, E. *et al.*, *Immunol.* 109:129 (1972); Goding, J. W. J. *Immunol. Meth.* 13:215 (1976)).

The labeled antibodies of the present invention can be used for *in vitro*, *in vivo*, and in situ assays to identify cells or tissues in which a fragment of the *Staphylococcus aureus* genome is expressed.

The present invention further provides the above-described antibodies immobilized on a solid support. Examples of such solid supports include plastics such as polycarbonate, complex carbohydrates such as agarose and sepharose, acrylic resins and such as polyacrylamide and latex beads. Techniques for coupling antibodies to such solid supports are well known in the art (Weir, D. M. *et al.*, "Handbook of Experimental Immunology" 4th Ed., Blackwell Scientific Publications, Oxford, England, Chapter 10 (1986); Jacoby, W. D. *et al.*, *Meth. Enzym.* 34 Academic Press, N. Y. (1974)). The immobilized antibodies of the present invention can be used for *in vitro*, *in vivo*, and in situ assays as well as for immunoaffinity purification of the proteins of the present invention.

3. Diagnostic Assays and Kits

The present invention further provides methods to identify the expression of one of the ORFs of the present invention, or homolog thereof, in a test sample, using one of the DFs, antigens or antibodies of the present invention.

In detail, such methods comprise incubating a test sample with one or more of the antibodies, or one or more of the DFs, or one or more antigens of the present invention and assaying for binding of the DFs, antigens or antibodies to components within the test sample.

Conditions for incubating a DF, antigen or antibody with a test sample vary. Incubation conditions depend on the format employed in the assay, the detection methods employed, and the type and nature of the DF or antibody used in the assay. One skilled in the art will recognize that any one of the commonly available hybridization, amplification or immunological assay formats can readily be adapted to employ the DFs, antigens or antibodies of the present invention. Examples of such assays can be found in Chard, T., *An Introduction to Radioimmunoassay and Related Techniques*, Elsevier Science Publishers, Amsterdam, The Netherlands (1986); Bullock, G. R. *et al.*, *Techniques in Immunocytochemistry*, Academic Press, Orlando, FL Vol. 1 (1982), Vol. 2 (1983), Vol. 3 (1985); Tijssen, P., *Practice and Theory of Enzyme Immunoassays: Laboratory Techniques in Biochemistry*; PCT publication WO95/32291, and *Molecular Biology*, Elsevier Science Publishers, Amsterdam, The Netherlands (1985), all of which are hereby incorporated herein by reference.

The test samples of the present invention include cells, protein or membrane extracts of cells, or biological fluids such as sputum, blood, serum, plasma, or urine. The test sample used in the above-described method will vary based

on the assay format, nature of the detection method and the tissues, cells or extracts used as the sample to be assayed. Methods for preparing protein extracts or membrane extracts of cells are well known in the art and can be readily be adapted in order to obtain a sample which is compatible with the system utilized.

In another embodiment of the present invention, kits are provided which contain the necessary reagents to carry out the assays of the present invention.

Specifically, the invention provides a compartmentalized kit to receive, in close confinement, one or more containers which comprises: (a) a first container comprising one of the Dfs, antigens or antibodies of the present invention; and (b) one or more other containers comprising one or more of the following: wash reagents, reagents capable of detecting presence of a bound DF, antigen or antibody.

In detail, a compartmentalized kit includes any kit in which reagents are contained in separate containers. Such containers include small glass containers, plastic containers or strips of plastic or paper. Such containers allows one to efficiently transfer reagents from one compartment to another compartment such that the samples and reagents are not cross-contaminated, and the agents or solutions of each container can be added in a quantitative fashion from one compartment to another. Such containers will include a container which will accept the test sample, a container which contains the antibodies used in the assay, containers which contain wash reagents (such as phosphate buffered saline, Tris-buffers, etc.), and containers which contain the reagents used to detect the bound antibody, antigen or DF.

Types of detection reagents include labelled nucleic acid probes, labelled secondary antibodies, or in the alternative, if the primary antibody is labelled, the enzymatic, or antibody binding reagents which are capable of reacting with the labelled antibody. One skilled in the art will readily recognize that the disclosed Dfs, antigens and antibodies of the present invention can be readily incorporated into one of the established kit formats which are well known in the art.

4. Screening Assay for Binding Agents

Using the isolated proteins of the present invention, the present invention further provides methods of obtaining and identifying agents which bind to a protein encoded by one of the ORFs of the present invention or to one of the fragments and the *Staphylococcus aureus* fragment and contigs herein described.

In general, such methods comprise steps of:

- (a) contacting an agent with an isolated protein encoded by one of the ORFs of the present invention, or an isolated fragment of the *Staphylococcus aureus* genome; and
- (b) determining whether the agent binds to said protein or said fragment.

The agents screened in the above assay can be, but are not limited to, peptides, carbohydrates, vitamin derivatives, or other pharmaceutical agents. The agents can be selected and screened at random or rationally selected or designed using protein modeling techniques.

For random screening, agents such as peptides, carbohydrates, pharmaceutical agents and the like are selected at random and are assayed for their ability to bind to the protein encoded by the ORF of the present invention.

Alternatively, agents may be rationally selected or designed. As used herein, an agent is said to be "rationally selected or designed" when the agent is chosen based on the configuration of the particular protein. For example, one skilled in the art can readily adapt currently available procedures to generate peptides, pharmaceutical agents and the like capable of binding to a specific peptide sequence in order to generate rationally designed antipeptide peptides, for example see Hurby *et al.*, Application of Synthetic Peptides: Antisense Peptides," In Synthetic Peptides, A User's Guide, W. H. Freeman, NY (1992), pp. 289-307, and Kaspczak *et al.*, Biochemistry 28:9230-8 (1989), or pharmaceutical agents, or the like.

In addition to the foregoing, one class of agents of the present invention, as broadly described, can be used to control gene expression through binding to one of the ORFs or EMFs of the present invention. As described above, such agents can be randomly screened or rationally designed/selected. Targeting the ORF or EMF allows a skilled artisan to design sequence specific or element specific agents, modulating the expression of either a single ORF or multiple ORFs which rely on the same EMF for expression control.

One class of DNA binding agents are agents which contain base residues which hybridize or form a triple helix by binding to DNA or RNA. Such agents can be based on the classic phosphodiester, ribonucleic acid backbone, or can be a variety of sulfhydryl or polymeric derivatives which have base attachment capacity.

Agents suitable for use in these methods usually contain 20 to 40 bases and are designed to be complementary to a region of the gene involved in transcription (triple helix - see Lee *et al.*, Nucl. Acids Res. 6:3073 (1979); Cooney *et al.*, Science 241:456 (1988); and Dervan *et al.*, Science 251: 1360 (1991)) or to the mRNA itself (antisense - Okano, J. Neurochem. 56:560 (1991); Oligodeoxynucleotides as Antisense Inhibitors of Gene Expression, CRC Press, Boca Raton, FL (1988)). Triple helix-formation optimally results in a shut-off of RNA transcription from DNA, while antisense RNA hybridization blocks translation of an mRNA molecule into polypeptide. Both techniques have been demonstrated

to be effective in model systems. Information contained in the sequences of the present invention can be used to design antisense and triple helix-forming oligonucleotides, and other DNA binding agents.

5. Pharmaceutical Compositions and Vaccines

The present invention further provides pharmaceutical agents which can be used to modulate the growth or pathogenicity of *Staphylococcus aureus*, or another related organism, *in vivo* or *in vitro*. As used herein, a "pharmaceutical agent" is defined as a composition of matter which can be formulated using known techniques to provide a pharmaceutical compositions. As used herein, the "pharmaceutical agents of the present invention" refers the pharmaceutical agents which are derived from the proteins encoded by the ORFs of the present invention or are agents which are identified using the herein described assays.

As used herein, a pharmaceutical agent is said to "modulate the growth or pathogenicity of *Staphylococcus aureus* or a related organism, *in vivo* or *in vitro*," when the agent reduces the rate of growth, rate of division, or viability of the organism in question. The pharmaceutical agents of the present invention can modulate the growth or pathogenicity of an organism in many fashions, although an understanding of the underlying mechanism of action is not needed to practice the use of the pharmaceutical agents of the present invention. Some agents will modulate the growth or pathogenicity by binding to an important protein thus blocking the biological activity of the protein, while other agents may bind to a component of the outer surface of the organism blocking attachment or rendering the organism more prone to act the bodies nature immune system. Alternatively, the agent may comprise a protein encoded by one of the ORFs of the present invention and serve as a vaccine. The development and use of vaccines derived from membrane associated polypeptides are well known in the art. The inventors have identified particularly preferred immunogenic *Staphylococcus aureus* polypeptides for use as vaccines. Such immunogenic polypeptides are described above and summarized in Table 4, below.

As used herein, a "related organism" is a broad term which refers to any organism whose growth or pathogenicity can be modulated by one of the pharmaceutical agents of the present invention. In general, such an organism will contain a homolog of the protein which is the target of the pharmaceutical agent or the protein used as a vaccine. As such, related organisms do not need to be bacterial but may be fungal or viral pathogens.

The pharmaceutical agents and compositions of the present invention may be administered in a convenient manner, such as by the oral, topical, intravenous, intraperitoneal, intramuscular, subcutaneous, intranasal or intradermal routes. The pharmaceutical compositions are administered in an amount which is effective for treating and/or prophylaxis of the specific indication. In general, they are administered in an amount of at least about 1 mg/kg body weight and in most cases they will be administered in an amount not in excess of about 1 g/kg body weight per day. In most cases, the dosage is from about 0.1 mg/kg to about 10 g/kg body weight daily, taking into account the routes of administration, symptoms, etc.

The agents of the present invention can be used in native form or can be modified to form a chemical derivative. As used herein, a molecule is said to be a "chemical derivative" of another molecule when it contains additional chemical moieties not normally a part of the molecule. Such moieties may improve the molecule's solubility, absorption, biological half life, etc. The moieties may alternatively decrease the toxicity of the molecule, eliminate or attenuate any undesirable side effect of the molecule, etc. Moieties capable of mediating such effects are disclosed in, among other sources, REMINGTON'S PHARMACEUTICAL SCIENCES (1980) cited elsewhere herein.

For example, such moieties may change an immunological character of the functional derivative, such as affinity for a given antibody. Such changes in immunomodulation activity are measured by the appropriate assay, such as a competitive type immunoassay. Modifications of such protein properties as redox or thermal stability, biological half-life, hydrophobicity, susceptibility to proteolytic degradation or the tendency to aggregate with carriers or into multimers also may be effected in this way and can be assayed by methods well known to the skilled artisan.

The therapeutic effects of the agents of the present invention may be obtained by providing the agent to a patient by any suitable means (e.g., inhalation, intravenously, intramuscularly, subcutaneously, enterally, or parenterally). It is preferred to administer the agent of the present invention so as to achieve an effective concentration within the blood or tissue in which the growth of the organism is to be controlled. To achieve an effective blood concentration, the preferred method is to administer the agent by injection. The administration may be by continuous infusion, or by single or multiple injections.

In providing a patient with one of the agents of the present invention, the dosage of the administered agent will vary depending upon such factors as the patient's age, weight, height, sex, general medical condition, previous medical history, etc. In general, it is desirable to provide the recipient with a dosage of agent which is in the range of from about 1 pg/kg to 10 mg/kg (body weight of patient), although a lower or higher dosage may be administered. The therapeutically effective dose can be lowered by using combinations of the agents of the present invention or another agent.

As used herein, two or more compounds or agents are said to be administered "in combination" with each other when either (1) the physiological effects of each compound, or (2) the serum concentrations of each compound can

be measured at the same time. The composition of the present invention can be administered concurrently with, prior to, or following the administration of the other agent.

The agents of the present invention are intended to be provided to recipient subjects in an amount sufficient to decrease the rate of growth (as defined above) of the target organism.

5 The administration of the agent(s) of the invention may be for either a "prophylactic" or "therapeutic" purpose. When provided prophylactically, the agent(s) are provided in advance of any symptoms indicative of the organisms growth. The prophylactic administration of the agent(s) serves to prevent, attenuate, or decrease the rate of onset of any subsequent infection. When provided therapeutically, the agent(s) are provided at (or shortly after) the onset of an indication of infection. The therapeutic administration of the compound(s) serves to attenuate the pathological symp-

10 toms of the infection and to increase the rate of recovery.

The agents of the present invention are administered to a subject, such as a mammal, or a patient, in a pharmaceutically acceptable form and in a therapeutically effective concentration. A composition is said to be "pharmacologically acceptable" if its administration can be tolerated by a recipient patient. Such an agent is said to be administered in a "therapeutically effective amount" if the amount administered is physiologically significant. An agent is physiologically significant if its presence results in a detectable change in the physiology of a recipient patient.

15 The agents of the present invention can be formulated according to known methods to prepare pharmaceutically useful compositions, whereby these materials, or their functional derivatives, are combined in admixture with a pharmaceutically acceptable carrier vehicle. Suitable vehicles and their formulation, inclusive of other human proteins, e. g., human serum albumin, are described, for example, in REMINGTON'S PHARMACEUTICAL SCIENCES, 16th Ed., 20 Osol, A., Ed., Mack Publishing, Easton PA (1980). In order to form a pharmaceutically acceptable composition suitable for effective administration, such compositions will contain an effective amount of one or more of the agents of the present invention, together with a suitable amount of carrier vehicle.

Additional pharmaceutical methods may be employed to control the duration of action. Control release preparations may be achieved through the use of polymers to complex or absorb one or more of the agents of the present invention. 25 The controlled delivery may be effectuated by a variety of well known techniques, including formulation with macromolecules such as, for example, polyesters, polyamino acids, polyvinyl, pyrrolidone, ethylenevinylacetate, methylcellulose, carboxymethylcellulose, or protamine, sulfate, adjusting the concentration of the macromolecules and the agent in the formulation, and by appropriate use of methods of incorporation, which can be manipulated to effectuate a desired time course of release. Another possible method to control the duration of action by controlled release preparations is 30 to incorporate agents of the present invention into particles of a polymeric material such as polyesters, polyamino acids, hydrogels, poly(lactic acid) or ethylene vinylacetate copolymers. Alternatively, instead of incorporating these agents into polymeric particles, it is possible to entrap these materials in microcapsules prepared, for example, by coacervation techniques or by interfacial polymerization with, for example, hydroxymethylcellulose or gelatine-microcapsules and poly(methylmethacrylate) microcapsules, respectively, or in colloidal drug delivery systems, for example, 35 liposomes, albumin microspheres, microemulsions, nanoparticles, and nanocapsules or in macroemulsions. Such techniques are disclosed in REMINGTON'S PHARMACEUTICAL SCIENCES (1980).

The invention further provides a pharmaceutical pack or kit comprising one or more containers filled with one or more of the ingredients of the pharmaceutical compositions of the invention. Associated with such container(s) can be 40 a notice in the form prescribed by a governmental agency regulating the manufacture, use or sale of pharmaceuticals or biological products, which notice reflects approval by the agency of manufacture, use or sale for human administration.

In addition, the agents of the present invention may be employed in conjunction with other therapeutic compounds.

6. Shot-Gun Approach to Megabase DNA Sequencing

45 The present invention further demonstrates that a large sequence can be sequenced using a random shotgun approach. This procedure, described in detail in the examples that follow, has eliminated the up front cost of isolating and ordering overlapping or contiguous subclones prior to the start of the sequencing protocols.

50 Certain aspects of the present invention are described in greater detail in the examples that follow. The examples are provided by way of illustration. Other aspects and embodiments of the present invention are contemplated by the inventors, as will be clear to those of skill in the art from reading the present disclosure.

55

ILLUSTRATIVE EXAMPLES**LIBRARIES AND SEQUENCING****1. Shotgun Sequencing Probability Analysis**

The overall strategy for a shotgun approach to whole genome sequencing follows from the Lander and Waterman (Landerman and Waterman, *Genomics* 2: 231 (1988)) application of the equation for the Poisson distribution. According to this treatment, the probability, P_0 , that any given base in a sequence of size L , in nucleotides, is not sequenced after a certain amount, n , in nucleotides, of random sequence has been determined can be calculated by the equation $P_0 = e^{-m}$, where m is L/n , the fold coverage.* For instance, for a genome of 2.8 Mb, $m=1$ when 2.8 Mb of sequence has been randomly generated (1X coverage). At that point, $P_0 = e^{-1} = 0.37$. The probability that any given base has not been sequenced is the same as the probability that any region of the whole sequence L has not been determined and, therefore, is equivalent to the fraction of the whole sequence that has yet to be determined. Thus, at one-fold coverage, approximately 37% of a polynucleotide of size L , in nucleotides has not been sequenced. When 14 Mb of sequence has been generated, coverage is 5X for a 2.8 Mb and the unsequenced fraction drops to .0067 or 0.67%. 5X coverage of a 2.8 Mb sequence can be attained by sequencing approximately 17,000 random clones from both insert ends with an average sequence read length of 410 bp.

Similarly, the total gap length, G , is determined by the equation $G = Le^{-m}$, and the average gap size, g , follows the equation, $g = L/n$. Thus, 5X coverage leaves about 240 gaps averaging about 82 bp in size in a sequence of a polynucleotide 2.8 Mb long.

The treatment above is essentially that of Lander and Waterman, *Genomics* 2: 231 (1988).

2. Random Library Construction

In order to approximate the random model described above during actual sequencing, a nearly ideal library of cloned genomic fragments is required. The following library construction procedure was developed to achieve this end.

Staphylococcus aureus DNA was prepared by phenol extraction. A mixture containing 600 ug DNA in 3.3 ml of 300 mM sodium acetate, 10 mM Tris-HCl, 1 mM Na-EDTA, 30% glycerol was sonicated for 1 min. at 0°C in a Branson Model 450 Sonicator at the lowest energy setting using a 3 mm probe. The sonicated DNA was ethanol precipitated and redissolved in 500 ul TE buffer.

To create blunt-ends, a 100 ul aliquot of the resuspended DNA was digested with 5 units of BAL31 nuclease (New England BioLabs) for 10 min at 30°C in 200 ul BAL31 buffer. The digested DNA was phenol-extracted, ethanol-precipitated, redissolved in 100 ul TE buffer, and then size-fractionated by electrophoresis through a 1.0% low melting temperature agarose gel. The section containing DNA fragments 1.6-2.0 kb in size was excised from the gel, and the LGT agarose was melted and the resulting solution was extracted with phenol to separate the agarose from the DNA. DNA was ethanol precipitated and redissolved in 20 ul of TE buffer for ligation to vector.

A two-step ligation procedure was used to produce a plasmid library with 97% inserts, of which >99% were single inserts. The first ligation mixture (50 ul) contained 2 ug of DNA fragments, 2 ug pUC18 DNA (Pharmacia) cut with SmaI and dephosphorylated with bacterial alkaline phosphatase, and 10 units of T4 ligase (GIBCO/BRL) and was incubated at 14°C for 4 hr. The ligation mixture then was phenol extracted and ethanol precipitated, and the precipitated DNA was dissolved in 20 ul TE buffer and electrophoresed on a 1.0% low melting agarose gel. Discrete bands in a ladder were visualized by ethidium bromide-staining and UV illumination and identified by size as insert (i), vector (v), v+i, v+2i, v+3i, etc. The portion of the gel containing v+i DNA was excised and the v+i DNA was recovered and resuspended into 20 ul TE. The v+i DNA then was blunt-ended by T4 polymerase treatment for 5 min. at 37° C in a reaction mixture (50 ul) containing the v+i linears, 500 uM each of the 4 dNTPs, and 9 units of T4 polymerase (New England BioLabs), under recommended buffer conditions. After phenol extraction and ethanol precipitation the repaired v+i linears were dissolved in 20 ul TE. The final ligation to produce circles was carried out in a 50 ul reaction containing 5 ul of v+i linears and 5 units of T4 ligase at 14°C overnight. After 10 min. at 70°C the following day, the reaction mixture was stored at -20°C.

This two-stage procedure resulted in a molecularly random collection of single-insert plasmid recombinants with minimal contamination from double-insert chimeras (<1%) or free vector (<3%).

Since deviation from randomness can arise from propagation the DNA in the host, *E.coli* host cells deficient in all recombination and restriction functions (A. Greener, *Strategies* 3 (1):5 (1990)) were used to prevent rearrangements, deletions, and loss of clones by restriction. Furthermore, transformed cells were plated directly on antibiotic diffusion plates to avoid the usual broth recovery phase which allows multiplication and selection of the most rapidly growing cells.

Plating was carried out as follows. A 100 ul aliquot of Epicurian Coli SURE II Supercompetent Cells (Stratagene 200152) was thawed on ice and transferred to a chilled Falcon 2059 tube on ice. A 1.7 ul aliquot of 1.42 M beta-

mercaptoethanol was added to the aliquot of cells to a final concentration of 25 mM. Cells were incubated on ice for 10 min. A 1 µl aliquot of the final ligation was added to the cells and incubated on ice for 30 min. The cells were heat pulsed for 30 sec. at 42° C and placed back on ice for 2 min. The outgrowth period in liquid culture was eliminated from this protocol in order to minimize the preferential growth of any given transformed cell. Instead the transformation mixture was plated directly on a nutrient rich SOB plate containing a 5 ml bottom layer of SOB agar (5% SOB agar: 20 g tryptone, 5 g yeast extract, 0.5 g NaCl, 1.5% Difco Agar per liter of media). The 5 ml bottom layer is supplemented with 0.4 ml of 50 mg/ml ampicillin per 100 ml SOB agar. The 15 ml top layer of SOB agar is supplemented with 1 ml X-Gal (2%), 1 ml MgCl₂ (1 M), and 1 ml MgSO₄/100 ml SOB agar. The 15 ml top layer was poured just prior to plating. Our titer was approximately 100 colonies/10 µl aliquot of transformation.

All colonies were picked for template preparation regardless of size. Thus, only clones lost due to "poison" DNA or deleterious gene products would be deleted from the library, resulting in a slight increase in gap number over that expected.

3. Random DNA Sequencing

High quality double stranded DNA plasmid templates were prepared using an alkaline lysis method developed in collaboration with 5Prime → 3Prime Inc. (Boulder, CO). Plasmid preparation was performed in a 96-well format for all stages of DNA preparation from bacterial growth through final DNA purification. Average template concentration was determined by running 25% of the samples on an agarose gel. DNA concentrations were not adjusted.

Templates were also prepared from a *Staphylococcus aureus* lambda genomic library. An unamplified library was constructed in Lambda DASH II vector (Stratagene). *Staphylococcus aureus* DNA (> 100 kb) was partially digested in a reaction mixture (200 µl) containing 50 µg DNA, 1X Sau3AI buffer, 20 units Sau3AI for 6 min. at 23 C. The digested DNA was phenol-extracted and centrifuges over a 10- 40% sucrose gradient. Fractions containing genomic DNA of 15-25 kb were recovered by precipitation. One µl of fragments was used with 1 µl of DASHII vector (Stratagene) in the recommended ligation reaction. One µl of the ligation mixture was used per packaging reaction following the recommended protocol with the Gigapack II XL Packaging Extract Phage were plated directly without amplification from the packaging mixture (after dilution with 500 µl of recommended SM buffer and chloroform treatment). Yield was about 2.5x10⁹ pfu/µl.

An amplified library was prepared from the primary packaging mixture according to the manufacturer's protocol. The amplified library is stored frozen in 7% dimethylsulfoxide. The phage titer is approximately 1x10⁹ pfu/ml.

Mini-liquid lysates (0.1 µl) are prepared from randomly selected plaques and template is prepared by long range PCR. Samples are PCR amplified using modified T3 and T7 primers, and Elongase Supermix (LT).

Sequencing reactions are carried out on plasmid templates using a combination of two workstations (BIOMEK 1000 and Hamilton Microlab 2200) and the Perkin-Elmer 9600 thermocycler with Applied Biosystems PRISM Ready Reaction Dye Primer Cycle Sequencing Kits for the M13 forward (M13-21) and the M13 reverse (M13RP1) primers. Dye terminator sequencing reactions are carried out on the lambda templates on a Perkin-Elmer 9600 Thermocycler using the Applied Biosystems Ready Reaction Dye Terminator Cycle Sequencing kits. Modified T7 and T3 primers are used to sequence the ends of the inserts from the Lambda DASH II library. Sequencing reactions are on a combination of AB 373 DNA Sequencers and ABI 377 DNA sequencers. All of the dye terminator sequencing reactions are analyzed using the 2X 9 hour module on the AB 377. Dye primer reactions are analyzed on a combination of ABI 373 and ABI 377 DNA sequencers. The overall sequencing success rate very approximately is about 85% for M13-21 and M13RP1 sequences and 65% for dye-terminator reactions. The average usable read length is 485 bp for M13-21 sequences, 445bp for M13RP1 sequences, and 375 bp for dye-terminator reactions.

4. Protocol for Automated Cycle Sequencing

The sequencing was carried out using Hamilton Microstation 2200, Perkin Elmer 9600 thermocyclers, ABI 373 and ABI 377 Automated DNA Sequencers. The Hamilton combines pre-aliquoted templates and reaction mixes consisting of deoxy- and dideoxynucleotides, the thermostable Taq DNA polymerase, fluorescently-labelled sequencing primers, and reaction buffer. Reaction mixes and templates were combined in the wells of a 96-well thermocycling plate and transferred to the Perkin Elmer 9600 thermocycler. Thirty consecutive cycles of linear amplification (i.e., one primer synthesis) steps were performed including denaturation, annealing of primer and template, and extension; i.e., DNA synthesis. A heated lid with rubber gaskets on the thermocycling plate prevents evaporation without the need for an oil overlay.

Two sequencing protocols were used: one for dye-labelled primers and a second for dye-labelled dideoxy chain terminators. The shotgun sequencing involves use of four dye-labelled sequencing primers, one for each of the four terminator nucleotide. Each dye-primer was labelled with a different fluorescent dye, permitting the four individual reactions to be combined into one lane of the 373 or 377 DNA Sequencer for electrophoresis, detection, and base-

calling. ABI currently supplies premixed reaction mixes in bulk packages containing all the necessary non-template reagents for sequencing. Sequencing can be done with both plasmid and PCR-generated templates with both dye-primers and dye-terminators with approximately equal fidelity, although plasmid templates generally give longer usable sequences.

Thirty-two reactions were loaded per ABI 373 Sequencer each day and 96 samples can be loaded on an ABI 377 per day. Electrophoresis was run overnight (ABI 373) or for 2 1/2 hours (ABI 377) following the manufacturer's protocols. Following electrophoresis and fluorescence detection, the ABI 373 or ABI 377 performs automatic lane tracking and base-calling. The lane-tracking was confirmed visually. Each sequence electropherogram (or fluorescence lane trace) was inspected visually and assessed for quality. Trailing sequences of low quality were removed and the sequence itself was loaded via software to a Sybase database (archived daily to 8mm tape). Leading vector polylinker sequence was removed automatically by a software program. Average edited lengths of sequences from the standard ABI 373 or ABI 377 were around 400 bp and depend mostly on the quality of the template used for the sequencing reaction.

INFORMATICS

1. Data Management

A number of information management systems for a large-scale sequencing lab have been developed. (For review see, for instance, Kerlavage *et al.*, *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences*, IEEE Computer Society Press, Washington D. C., 585 (1993)) The system used to collect and assemble the sequence data was developed using the Sybase relational database management system and was designed to automate data flow wherever possible and to reduce user error. The database stores and correlates all information collected during the entire operation from template preparation to final analysis of the genome. Because the raw output of the ABI 373 Sequencers was based on a Macintosh platform and the data management system chosen was based on a Unix platform, it was necessary to design and implement a variety of multi-user, client-server applications which allow the raw data as well as analysis results to flow seamlessly into the database with a minimum of user effort.

2. Assembly

An assembly engine (TIGR Assembler) developed for the rapid and accurate assembly of thousands of sequence fragments was employed to generate contigs. The TIGR assembler simultaneously clusters and assembles fragments of the genome. In order to obtain the speed necessary to assemble more than 10^4 fragments, the algorithm builds a hash table of 12 bp oligonucleotide subsequences to generate a list of potential sequence fragment overlaps. The number of potential overlaps for each fragment determines which fragments are likely to fall into repetitive elements. Beginning with a single seed sequence fragment, TIGR Assembler extends the current contig by attempting to add the best matching fragment based on oligonucleotide content. The contig and candidate fragment are aligned using a modified version of the Smith-Waterman algorithm which provides for optimal gapped alignments (Waterman, M. S., *Methods in Enzymology* 164: 765 (1988)). The contig is extended by the fragment only if strict criteria for the quality of the match are met. The match criteria include the minimum length of overlap, the maximum length of an unmatched end, and the minimum percentage match. These criteria are automatically lowered by the algorithm in regions of minimal coverage and raised in regions with a possible repetitive element. The number of potential overlaps for each fragment determines which fragments are likely to fall into repetitive elements. Fragments representing the boundaries of repetitive elements and potentially chimeric fragments are often rejected based on partial mismatches at the ends of alignments and excluded from the current contig. TIGR Assembler is designed to take advantage of clone size information coupled with sequencing from both ends of each template. It enforces the constraint that sequence fragments from two ends of the same template point toward one another in the contig and are located within a certain range of base pairs (definable for each clone based on the known clone size range for a given library).

3. Identifying Genes

The predicted coding regions of the *Staphylococcus aureus* genome were initially defined with the program zorf, which finds ORFs of a minimum length. The predicted coding region sequences were used in searches against a database of all *Staphylococcus aureus* nucleotide sequences from GenBank (release 92.0), using the BLASTN search method to identify overlaps of 50 or more nucleotides with at least a 95% identity. Those ORFs with nucleotide sequence matches are shown in Table 1. The ORFs without such matches were translated to protein sequences and compared to a non-redundant database of known proteins generated by combining the Swiss-prot, PIR and GenPept databases. ORFs of at least 80 amino acids that matched a database protein with BLASTP probability less than or equal to 0.01 are shown in Table 2. The table also lists assigned functions based on the closest match in the databases.

ORFs of at least 120 amino acids that did not match protein or nucleotide sequences in the databases at these levels are shown in Table 3.

ILLUSTRATIVE APPLICATIONS

1. Production of an Antibody to a *Staphylococcus aureus* Protein

Substantially pure protein or polypeptide is isolated from the transfected or transformed cells using any one of the methods known in the art. The protein can also be produced in a recombinant prokaryotic expression system, such as *E. coli*, or can be chemically synthesized. Concentration of protein in the final preparation is adjusted, for example, by concentration on an Amicon filter device, to the level of a few micrograms/ml. Monoclonal or polyclonal antibody to the protein can then be prepared as follows.

2. Monoclonal Antibody Production by Hybridoma Fusion

Monoclonal antibody to epitopes of any of the peptides identified and isolated as described can be prepared from murine hybridomas according to the classical method of Kohler, G. and Milstein, C., Nature 256:495 (1975) or modifications of the methods thereof. Briefly, a mouse is repetitively inoculated with a few micrograms of the selected protein over a period of a few weeks. The mouse is then sacrificed, and the antibody producing cells of the spleen isolated. The spleen cells are fused by means of polyethylene glycol with mouse myeloma cells, and the excess unfused cells destroyed by growth of the system on selective media comprising aminopterin (HAT media). The successfully fused cells are diluted and aliquots of the dilution placed in wells of a microtiter plate where growth of the culture is continued. Antibody-producing clones are identified by detection of antibody in the supernatant fluid of the wells by immunoassay procedures, such as ELISA, as originally described by Engvall, E., Meth. Enzymol. 70:419 (1980), and modified methods thereof. Selected positive clones can be expanded and their monoclonal antibody product harvested for use. Detailed procedures for monoclonal antibody production are described in Davis, L. *et al.* Basic Methods in Molecular Biology Elsevier, New York. Section 21-2 (1989).

3. Polyclonal Antibody Production by Immunization

Polyclonal antiserum containing antibodies to heterogeneous epitopes of a single protein can be prepared by immunizing suitable animals with the expressed protein described above, which can be unmodified or modified to enhance immunogenicity. Effective polyclonal antibody production is affected by many factors related both to the antigen and the host species. For example, small molecules tend to be less immunogenic than other and may require the use of carriers and adjuvant. Also, host animals vary in response to site of inoculations and dose, with both inadequate or excessive doses of antigen resulting in low titer antisera. Small doses (ng level) of antigen administered at multiple intradermal sites appears to be most reliable. An effective immunization protocol for rabbits can be found in Vaitukaitis, J. *et al.*, J. Clin. Endocrinol. Metab. 33:988-991 (1971).

Booster injections can be given at regular intervals, and antiserum harvested when antibody titer thereof, as determined semi-quantitatively, for example, by double immunodiffusion in agar against known concentrations of the antigen, begins to fall. See, for example, Ouchterlony, O. *et al.*, Chap. 19 in: Handbook of Experimental Immunology, Wier, D., ed, Blackwell (1973). Plateau concentration of antibody is usually in the range of 0.1 to 0.2 mg/ml of serum (about 12M). Affinity of the antisera for the antigen is determined by preparing competitive binding curves, as described, for example, by Fisher, D., Chap. 42 in: Manual of Clinical Immunology, second edition, Rose and Friedman, eds., Amer. Soc. For Microbiology, Washington, D. C. (1980).

Antibody preparations prepared according to either protocol are useful in quantitative immunoassays which determine concentrations of antigen-bearing substances in biological samples; they are also used semi-quantitatively or qualitatively to identify the presence of antigen in a biological sample. In addition, they are useful in various animal models of Staphylococcal disease known to those of skill in the art as a means of evaluating the protein used to make the antibody as a potential vaccine target or as a means of evaluating the antibody as a potential immunotherapeutic reagent.

3. Preparation of PCR Primers and Amplification of DNA

Various fragments of the *Staphylococcus aureus* genome, such as those of Tables 1-3 and SEQ ID NOS:1-5,191 can be used, in accordance with the present invention, to prepare PCR primers for a variety of uses. The PCR primers are preferably at least 15 bases, and more preferably at least 18 bases in length. When selecting a primer sequence, it is preferred that the primer pairs have approximately the same G/C ratio, so that melting temperatures are approxi-

mately the same. The PCR primers and amplified DNA of this Example find use in the Examples that follow.

4. Gene expression from DNA Sequences Corresponding to ORFs

A fragment of the *Staphylococcus aureus* genome provided in Tables 1-3 is introduced into an expression vector using conventional technology. Techniques to transfer cloned sequences into expression vectors that direct protein translation in mammalian, yeast, insect or bacterial expression systems are well known in the art. Commercially available vectors and expression systems are available from a variety of suppliers including Stratagene (La Jolla, California), Promega (Madison, Wisconsin), and Invitrogen (San Diego, California). If desired, to enhance expression and facilitate proper protein folding, the codon context and codon pairing of the sequence may be optimized for the particular expression organism, as explained by Hatfield *et al.*, U. S. Patent No. 5,082,767, incorporated herein by this reference.

The following is provided as one exemplary method to generate polypeptide(s) from cloned ORFs of the *Staphylococcus aureus* genome fragment. Bacterial ORFs generally lack a poly A addition signal. The addition signal sequence can be added to the construct by, for example, splicing out the poly A addition sequence from pSG5 (Stratagene) using BglI and SalI restriction endonuclease enzymes and incorporating it into the mammalian expression vector pXT1 (Stratagene) for use in eukaryotic expression systems. pXT1 contains the LTRs and a portion of the gag gene of Moloney Murine Leukemia Virus. The positions of the LTRs in the construct allow efficient stable transfection. The vector includes the Herpes Simplex thymidine kinase promoter and the selectable neomycin gene. The *Staphylococcus aureus* DNA is obtained by PCR from the bacterial vector using oligonucleotide primers complementary to the *Staphylococcus aureus* DNA and containing restriction endonuclease sequences for PstI incorporated into the 5' primer and BglII at the 5' end of the corresponding *Staphylococcus aureus* DNA 3' primer, taking care to ensure that the *Staphylococcus aureus* DNA is positioned such that its followed with the poly A addition sequence. The purified fragment obtained from the resulting PCR reaction is digested with PstI, blunt ended with an exonuclease, digested with BglII, purified and ligated to pXT1, now containing a poly A addition sequence and digested BglII.

The ligated product is transfected into mouse NIH 3T3 cells using Lipofectin (Life Technologies, Inc., Grand Island, New York) under conditions outlined in the product specification. Positive transfectants are selected after growing the transfected cells in 600 ug/ml G418 (Sigma, St. Louis, Missouri). The protein is preferably released into the supernatant. However if the protein has membrane binding domains, the protein may additionally be retained within the cell or expression may be restricted to the cell surface. Since it may be necessary to purify and locate the transfected product, synthetic 15-mer peptides synthesized from the predicted *Staphylococcus aureus* DNA sequence are injected into mice to generate antibody to the polypeptide encoded by the *Staphylococcus aureus* DNA.

Alternatively and if antibody production is not possible, the *Staphylococcus aureus* DNA sequence is additionally incorporated into eukaryotic expression vectors and expressed as, for example, a globin fusion. Antibody to the globin moiety then is used to purify the chimeric protein. Corresponding protease cleavage sites are engineered between the globin moiety and the polypeptide encoded by the *Staphylococcus aureus* DNA so that the latter may be freed from the formed by simple protease digestion. One useful expression vector for generating globin chimerics is pSG5 (Stratagene). This vector encodes a rabbit globin. Intron II of the rabbit globin gene facilitates splicing of the expressed transcript, and the polyadenylation signal incorporated into the construct increases the level of expression. These techniques are well known to those skilled in the art of molecular biology. Standard methods are published in methods texts such as Davis *et al.*, cited elsewhere herein, and many of the methods are available from the technical assistance representatives from Stratagene, Life Technologies, Inc., or Promega. Polypeptides of the invention also may be produced using *in vitro* translation systems such as *in vitro* ExpressTM Translation Kit (Stratagene).

While the present invention has been described in some detail for purposes of clarity and understanding, one skilled in the art will appreciate that various changes in form and detail can be made without departing from the true scope of the invention.

All patents, patent applications and publications referred to above are hereby incorporated by reference.

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	percent ident	HSP nt length	ORF nt length
1	1	1419	757	[emb]K17301[CAHD]	S. aureus DNA for hld gene and for part of agr gene	100	663	663
1	2	3273	2452	[emb]X52543[SAAG]	S. aureus agrA, agrB and hld genes	99	809	822
1	5	6418	5651	[dbj]D14711[STAH]	Staphylococcus aureus HSP10 and HSP60 genes	98	223	768
5	1	807	439	[emb]X72700[SAPV]	S. aureus genes for S and F components of Panton-Valentine leucocidins	81	216	369
5	4	3031	3571	[emb]X72700[SAPV]	S. aureus genes for S and F components of Panton-Valentine leucocidins	95	424	1461
10	1	86	904	[gb]U25288[	Staphylococcus aureus gyrase-like protein alpha and beta subunit (gria and grilB) genes, complete cds	98	715	819
16	5	5302	6246	[gb]U35773[	Staphylococcus aureus prolipoprotein diacylglycerol transferase (lgt) gene, complete cds	94	251	945
16	6	6249	7091	[gb]U35773[	Staphylococcus aureus prolipoprotein diacylglycerol transferase (lgt) gene, complete cds	99	843	843
16	7	7084	7584	[gb]U35773[	Staphylococcus aureus prolipoprotein diacylglycerol transferase (lgt) gene, complete cds	99	342	501
20	1	995	549	[gb]U19300[	Staphylococcus aureus DNA sequence encoding three ORFs, complete cds; prophage phi-11 sequence homology, 5' flank	100	443	447
20	2	1011	841	[gb]U19300[	Staphylococcus aureus DNA sequence encoding three ORFs, complete cds; prophage phi-11 sequence homology, 5' flank	91	137	171
20	3	2010	1798	[gb]U19300[	Staphylococcus aureus DNA sequence encoding three ORFs, complete cds; prophage phi-11 sequence homology, 5' flank	100	110	213
20	4	5300	3825	[gb]U19300[	Staphylococcus aureus peptidoglycan hydrolase gene, complete cds	100	948	1476
20	5	4786	4282	[gb]U19300[	Staphylococcus aureus peptidoglycan hydrolase gene, complete cds	100	309	507
26	1	2	145	[gb]U41072[	Staphylococcus aureus isoleucyl-tRNA synthetase (ileS) gene, partial cds	100	126	164
26	2	84	557	[gb]U41072[	Staphylococcus aureus isoleucyl-tRNA synthetase (ileS) gene, partial cds	99	430	474
26	3	763	3531	[emb]X74219[SAIL]	S. aureus gene for isoleucyl-tRNA synthetase	99	2769	2769
29	3	1261	4392	[gb]U66665[	Staphylococcus aureus DNA fragment with class II promoter activity	100	117	3132
31	14	14977	13463	[emb]X73889[SAP1]	S. aureus genes p1 and p2	99	1351	1515
31	15	14241	13855	[emb]X73889[SAP1]	S. aureus genes p1 and p2	98	258	387
38	17	14284	13112	[gb]M12715[	S. aureus gdh gene encoding lipase (glycerol ester hydrolase)	100	372	1173
38	19	13434	15518	[gb]M12715[	S. aureus gdh gene encoding lipase (glycerol ester hydrolase)	100	2085	2085

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	Percent ident	HSP nt length	ORF nt length
46	3	119	1727	[gb|U73374]	Staphylococcus aureus type 8 capsule genes, cap8A, cap8D, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	98	1209	1209
46	3	1720	2295	[gb|U73374]	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	98	576	576
46	4	2259	3182	[gb|U73374]	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	97	924	924
46	5	3173	4498	[gb|U73374]	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	98	1283	1326
46	6	4536	5720	[gb|U73374]	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	98	1185	1185
46	7	6455	6120	[gb|U73374]	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	99	278	336
48	1	2	955	[gb|L25893]	Staphylococcus aureus recA gene, complete cds	99	954	954
50	3	4465	2924	[emb|X65029|SAAR]	S. aureus hpc gene	100	88	1542
50	4	4108	3515	[emb|X65029|SAAR]	S. aureus hpc gene	98	540	596
54	3	5074	3392	[emb|X62992|SAFN]	S. aureus fnbB gene for fibronectin binding protein B	100	1668	1683
54	4	4865	4122	[emb|X62992|SAFN]	S. aureus fnbB gene for fibronectin binding protein B	99	720	744
54	5	5036	4562	[emb|X62992|SAFN]	S. aureus fnbB gene for fibronectin binding protein B	100	463	495
54	6	11386	8300	[gb|J04151]	S. aureus fibronectin-binding protein (fnbA) mRNA, complete cds	100	3087	3087
58	3	1743	2819	[emb|X87104|SADN]	S. aureus mdr, pbp4 and taqD genes (SC511-55 isolate)	89	68	1077
58	4	2658	3280	[emb|X91786|SAPB]	S. aureus abcA, pbp4, and tagD genes	99	423	423
58	5	6005	4701	[emb|X91786|SAPB]	S. aureus abcA, pbp4, and tagD genes	99	1305	1305
58	6	5677	5378	[gb|J29478]	Staphylococcus aureus ABC transporter-like protein AbcA (abcA) gene, partial cds	100	300	300
58	7	5086	6840	[emb|X91786|SAPB]	S. aureus abcA, pbp4, and tagD genes	99	1755	1755
72	1	888	445	[gb|J21854]	S. aureus agr gene encoding an accessory gene regulator protein, complete cds	100	444	444
72	2	2457	1453	[emb|X52543|SAAG]	S. aureus agrA, agrB and hid genes	99	673	1005

TABLE 1

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	Percent Ident	HSP nt Length	ORF nt Length
82	1	357	3917	emb|X64172|SARP	S.aureus rplL, orf102, rps8(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	99	2396	3561
82	2	4027	7677	emb|X85233|SARP	S.aureus DNA for rpoC gene	99	3171	3651
82	3	7745	8068	gb|U20869|	Staphylococcus aureus ribosomal protein S12 (rpsL) gene, complete cds, Ribosomal protein S7 (rpsC) and ORF 1 genes, partial cds	100	320	324
82	4	8103	8579	gb|U20869|	Staphylococcus aureus ribosomal protein S12 (rpsL) gene, complete cds, Ribosomal protein S7 (rpsC) and ORF 1 genes, partial cds	100	477	477
82	5	8618	8821	gb|U20869|	Staphylococcus aureus ribosomal protein S12 (rpsL) gene, complete cds, Ribosomal protein S7 (rpsC) and ORF 1 genes, partial cds	100	154	204
84	1	18	191	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, complete cds	98	164	174
84	2	189	893	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, complete cds	94	705	705
84	3	887	1660	nb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, complete cds	99	774	774
84	4	1584	3503	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, complete cds	98	1920	1920
84	5	3394	4521	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, complete cds	97	1128	1128
84	6	4519	5643	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, complete cds	97	1125	1125
96	2	1245	3896	emb|Z18852|SACF	S.aureus gene for clumping factor	83	660	2652
97	2	625	882	gb|U41072|	Staphylococcus aureus isoleucyl-tRNA synthetase (ileS) gene, partial cds	97	68	258
111	1	3	452	gb|L41499|	Staphylococcus aureus ORF1, partial cds, ORF2, ORF3, autolysin (atl) genes, complete cds	100	450	450
111	2	526	1041	gb|L41499|	Staphylococcus aureus ORF1, partial cds, ORF2, ORF3, autolysin (atl) genes, complete cds	99	516	516
117	2	1278	1958	gb|W83994|	Staphylococcus aureus prolipoprotein signal peptidase (isp) gene, complete cds	100	61	681

TABLE 1

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	percent ident	HSP nt length	ORF nt length
118	4	3787	4254	dbj|U30690|STAN	Staphylococcus aureus genes for ORF37; HSP20; HSP70; HSP40; ORF35, complete cds	99	467	468
130	4	2597	3640	emb|X13290|SATN	Staphylococcus aureus multi-resistance plasmid pSK1 DNA containing transposon Tn603	78	956	1044
130	5	3813	4265	emb|Z16422|SADI	S. aureus dfb gene for dihydrofolate reductase	98	416	453
130	6	4109	5172	emb|Z16422|SADI	S. aureus dfb gene for dihydrofolate reductase	98	607	864
136	4	5296	6207	emb|X71437|SAGY	S. aureus genes gyrB, gyrA and recP (partial)	97	818	912
136	5	11680	8987	dbj|D10489|STAG	Staphylococcus aureus genes for DNA gyrase A and B, complete cds	100	2694	2694
136	6	112886	10940	dbj|U10489|STAG	Staphylococcus aureus genes for DNA gyrase A and B, complete cds	99	1947	1947
136	7	112592	11765	gb|S77055|	recf cluster: dnaA-replisome assembly protein...gyrB-DNA gyrase beta subunit [Staphylococcus aureus, Y8886, Genomic, 5 genes, 3573 nt]	99	822	828
143	3	4171	2867	gb|U36379|	Staphylococcus aureus S-adenosylmethionine synthetase gene, complete cds	99	1305	1305
143	4	3100	4281	gb|L42943|	Staphylococcus aureus (clone KIN50) phosphoenolpyruvate carboxykinase (pckA) gene, complete cds	100	1170	1182
143	5	4254	4718	gb|U51133|	Staphylococcus aureus phosphoenolpyruvate carboxykinase (pckA) gene, complete cds	100	449	465
143	9	6977	7261	gb|U51132|	Staphylococcus aureus o-succinylbenzoic acid CoA ligase (menE), and o-succinylbenzoic acid synthetase (menC) genes, complete cds	100	75	285
143	10	9464	8361	gb|U51132|	Staphylococcus aureus o-succinylbenzoic acid CoA ligase (menE), and o-succinylbenzoic acid synthetase (menC) genes, complete cds	100	1104	1104
143	11	11232	9748	gb|U51132|	Staphylococcus aureus o-succinylbenzoic acid CoA ligase (menE), and o-succinylbenzoic acid synthetase (menC) genes, complete cds	100	1485	1485
143	12	10739	10320	gb|U51132|	Staphylococcus aureus o-succinylbenzoic acid CoA ligase (menE), and o-succinylbenzoic acid synthetase (menC) genes, complete cds	100	332	420
152	5	2454	3437	emb|X58434|SAPD	S. aureus pdhA, pdhC and pdhD genes for pyruvate decarboxylase, dihydroliipoamide acetyltransferase and dihydroliipoamide dehydrogenase	99	305	984
152	6	3513	4820	emb|X58434|SAPD	S. aureus pdhA, pdhC and pdhD genes for pyruvate decarboxylase, dihydroliipoamide acetyltransferase and dihydroliipoamide dehydrogenase	98	1308	1308
152	7	4818	6230	emb|X58434|SAPD	S. aureus pdhA, pdhC and pdhD genes for pyruvate decarboxylase, dihydroliipoamide acetyltransferase and dihydroliipoamide dehydrogenase	99	1413	1413
153	1	387	1526	gb|S77055|	recf cluster: dnaA-replisome assembly protein...gyrB-DNA gyrase beta subunit [Staphylococcus aureus, Y8886, Genomic, 5 genes, 3573 nt]	99	1140	1140
153	2	1877	2152	gb|E77055|	recf cluster: dnaA-replisome assembly protein...gyrB-DNA gyrase beta subunit [Staphylococcus aureus, Y8886, Genomic, 5 genes, 3573 nt]	100	276	276

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	Percent Ident	USP nt length	ORF nt length
153	3	2143	2289	gb|J77055|	recP cluster: dnaA-replisome assembly protein...gyrB-DNA gyrase beta subunit [Staphylococcus aureus, Y8886, Genomic, 5 genes, 3573 nt]	99	113	147
154	10	10792	9314	gb|J06451|	[Staphylococcus aureus proline permease homolog (putP) gene, complete cds]	91	154	1479
154	11	9935	9615	gb|J06451|	[Staphylococcus aureus proline permease homolog (putP) gene, complete cds]	99	229	331
154	12	9943	10167	gb|J06451|	[Staphylococcus aureus proline permease homolog (putP) gene, complete cds]	94	123	225
154	13	10089	11501	gb|J06451|	[Staphylococcus aureus proline permease homolog (putP) gene, complete cds]	99	1326	1413
159	2	2195	1212	dbj|J28879|STAP	[Staphylococcus aureus gene for penicillin-binding protein 1, complete cds]	100	71	984
161	3	2596	2270	gb|J48394|	[Staphylococcus aureus prolipoprotein signal peptidase (lsp) gene, complete cds]	92	203	327
162	1	1406	705	gb|J21221|	[Staphylococcus aureus hyaluronate lyase (hysA) gene, complete cds]	100	702	702
163	4	1363	1772	gb|J19770|	[Staphylococcus aureus pyrrolidone carboxyl peptidase (pcp) gene, complete cds]	96	127	510
164	7	4774	9117	dbj|J086727|J0867	[Staphylococcus aureus DNA for DNA polymerase III, complete cds]	99	3470	4344
168	7	7448	6447	gb|J21636|	[Staphylococcus aureus cmp-binding-factor 1 (cbf1) and ORF X genes, complete cds]	100	1002	1002
168	8	9538	7961	gb|J21636|	[Staphylococcus aureus cmp-binding-factor 1 (cbf1) and ORF X genes, complete cds]	99	1158	1578
173	6	9240	7801	gb|J03479|	[S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds]	100	1440	1440
173	7	11252	9522	gb|J03479|	[S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds]	99	1731	1731
173	8	8285	8704	gb|J03479|	[S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds]	100	420	420
173	9	10168	9839	gb|J03479|	[S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds]	100	330	330
173	10	11615	110829	emb|X14827|SALA	[Staphylococcus aureus lacC and lacD genes]	100	987	987
173	11	12721	11774	emb|X14827|SALA	[Staphylococcus aureus lacC and lacD genes]	100	948	948
173	12	12838	12305	gb|J46724|	[S. aureus tagatose 6-phosphate isomerase gene, complete cds]	100	534	534
173	13	13243	12773	gb|J32103|	[Staphylococcus aureus lac repressor (lacR) gene, complete cds and lacA repressor (lacA), partial cds]	100	471	471
173	14	14633	13866	gb|J32103|	[Staphylococcus aureus lac repressor (lacR) gene, complete cds and lacA repressor (lacA), partial cds]	100	768	768

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	percent ident	HSP nt length	ORF nt length
178	1	2	655	gb|U52961|	Staphylococcus aureus holin-like protein LrgA (lrgA) and LrgB (lrgB) genes, complete cds	100	115	654
178	2	2201	1482	gb|U52961|	Staphylococcus aureus holin-like protein LrgA (lrgA) and LrgB (lrgB) genes, complete cds	100	720	720
178	3	2361	1909	gb|U52961|	Staphylococcus aureus holin-like protein LrgA (lrgA) and LrgB (lrgB) genes, complete cds	100	453	453
178	4	1551	1853	gb|U52961|	Staphylococcus aureus holin-like protein LrgA (lrgA) and LrgB (lrgB) genes, complete cds	100	303	303
178	5	3541	2777	gb|U42945|	Staphylococcus aureus lytS and lytR genes, complete cds	99	765	765
178	6	3294	3025	gb|U42945|	Staphylococcus aureus lytS and lytR genes, complete cds	99	270	270
181	1	1114	590	gb|M61177|	S. aureus sigma factor (plac) gene, complete cds	99	499	525
182	1	3	341	emb|X61307|SASP	Staphylococcus aureus spa gene for protein A	98	277	339
182	2	690	2312	gb|J01786|	S. aureus spa gene coding for protein A, complete cds	97	1332	1623
182	3	5861	4251	emb|X61307|SASP	Staphylococcus aureus spa gene for protein A	99	119	1611
185	1	3	824	gb|U31979|	Staphylococcus aureus chorismate synthase (aroC) and nucleoside diphosphate kinase (ndk) genes, complete cds, dehydroascinate synthase (aroB) and geranylgeranyl pyrophosphate synthetase homolog (gerCC) genes, partial cds	90	132	822
191	3	841	2760	emb|X17679|SACO	Staphylococcus aureus coa gene for coagulase	99	1920	1920
191	4	2967	3143	emb|X16457|SAST	Staphylococcus aureus gene for staphylocoagulase	99	177	177
191	5	5768	4566	emb|X16457|SAST	Staphylococcus aureus gene for staphylocoagulase	99	250	1203
196	1	1741	872	gb|U36472|	Staphylococcus aureus lysyl-tRNA synthetase gene, complete cds, transfer RNA (tRNA) genes, 5S ribosomal RNA (5S rRNA) gene, 16S ribosomal RNA (16S rRNA) gene, 23S ribosomal RNA (23S rRNA) gene	99	870	870
198	3	1688	2011	emb|X93205|SAPT	S. aureus ptstH and ptstI genes	99	324	324
198	4	2005	2310	emb|X93205|SAPT	S. aureus ptstH and ptstI genes	97	304	306
202	1	163	1305	emb|X97985|SA12	S. aureus orfs 1,2,3 & 4	99	1143	1143
202	2	1303	2175	emb|X73889|SAP1	S. aureus genes P1 and P2	94	444	873
210	1	3116	1558	dbj|D17366|STNA	Staphylococcus aureus atl gene for autolysin, complete cds and other ORFs	99	1552	1557
210	2	2939	2232	gb|U41499|	Staphylococcus aureus ORF1, partial cds, ORF2, ORF3, autolysin (atl) genes, complete cds	99	684	708
214	11	7429	7770	dbj|D86240|D862	Staphylococcus aureus gene for unknown function and dit operon dltA, dltB, dltC and dltD genes, complete cds	96	157	342

TABLE 1

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	Percent ident	HSP nt length	ORF nt length
216	3	398	1318	emb|X72700|SAPV	S. aureus genes for S and P components of Pantone-Valentine leucocidins	88	265	921
219	2	1810	1073	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP20; HSP70; HSP40; ORF35, complete cds	100	60	738
219	3	2975	2035	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP20; HSP70; HSP40; ORF35, complete cds	99	945	945
219	4	4159	3196	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP20; HSP70; HSP40; ORF35, complete cds	99	1164	1164
219	5	7044	5176	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP20; HSP70; HSP40; ORF35, complete cds	98	1869	1869
219	6	6557	5883	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP20; HSP70; HSP40; ORF35, complete cds	99	675	675
219	7	6801	6334	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP20; HSP70; HSP40; ORF35, complete cds	98	468	468
221	8	10816	10034	gb|U19298|	Staphylococcus aureus phosphatidylinositol-specific phospholipase C (plc) gene, complete cds	91	67	783
223	1	2855	1506	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	99	102	1350
234	1	2	1357	emb|X97985|SA12	S. aureus orfs 1,2,3 & 4	100	176	1356
234	2	1694	2485	emb|X97985|SA12	S. aureus orfs 1,2,3 & 4	100	782	792
234	3	2648	3148	emb|X97985|SA12	S. aureus orfs 1,2,3 & 4	99	501	501
234	4	3120	4604	emb|X97985|SA12	S. aureus orfs 1,2,3 & 4	99	1305	1485
236	6	3826	5322	gb|U48826|	Staphylococcus aureus elastin binding protein (ebpS) gene, complete cds	96	648	1497
248	1	2	403	emb|X62288|SAP2	S. aureus DNA for penicillin-binding protein 2	100	103	402
248	2	388	852	gb|U35426|	Staphylococcus aureus penicillin-binding protein 2 (pbp2) gene, complete cds	99	465	465
253	2	1539	1093	gb|U46541|	Staphylococcus aureus sara gene, complete cds	96	447	447
254	2	150	1835	gb|U57060|	Staphylococcus aureus sda gene, complete cds	94	142	1686
254	3	1973	2728	gb|U57060|	Staphylococcus aureus sda gene, complete cds	99	756	756
260	1	2	1900	gb|U90693|	Staphylococcus aureus glycerol ester hydrolase (lip) gene, complete cds	99	1213	1899
265	1	1	942	dbj|D31131|STAS	Staphylococcus aureus gene for a participant in homogeneous expression of high-level methicillin resistance, complete cds	99	941	942

TABLE 1

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	patch gene name	percent ident	ORF nt length	ORF nt length
285	2	688	476	[dbj|021131|STAS	Staphylococcus aureus gene for a participant in homogeneous expression of high-level methicillin resistance, complete cds	99	213	213
285	3	2418	1765	[dbj|021131|STAS	Staphylococcus aureus gene for a participant in homogeneous expression of high-level methicillin resistance, complete cds	98	69	654
286	1	2	1018	[dbj|014711|STAH	Staphylococcus aureus HSP10 and HSP60 genes	98	743	1017
282	1	1	525	[gb|572488|	hemB-porphobilinogen synthase [Staphylococcus aureus, SA1959, Genomic, 1087 nt]	100	110	525
282	2	516	1502	[gb|572488|	hemB-porphobilinogen synthase [Staphylococcus aureus, SA1959, Genomic, 1087 nt]	100	952	987
284	1	3	170	[gb|M63176|	Staphylococcus aureus helicase required for T181 replication (pcrA) gene, complete cds	98	84	168
284	2	282	1034	[gb|M63176|	Staphylococcus aureus helicase required for T181 replication (pcrA) gene, complete cds	100	712	753
284	3	1028	2026	[gb|M63176|	Staphylococcus aureus helicase required for T181 replication (pcrA) gene, complete cds	99	979	999
284	4	1990	2202	[gb|M63176|	Staphylococcus aureus helicase required for T181 replication (pcrA) gene, complete cds	98	187	213
289	3	1536	1991	[gb|M32470|	S.aureus SauIAI-restriction-enzyme and SauIAI-modification-enzyme genes, complete cds	99	338	456
303	1	2	888	[gb|L01055|	Staphylococcus aureus gamma-hemolysin components A, B and C (hlgA, hlgB, hlgC) genes, complete cds	99	867	867
303	2	1409	2383	[gb|L01055|	Staphylococcus aureus gamma-hemolysin components A, B and C (hlgA, hlgB, hlgC) genes, complete cds	100	975	975
303	3	2367	3161	[gb|L01055|	Staphylococcus aureus gamma-hemolysin components A, B and C (hlgA, hlgB, hlgC) genes, complete cds	99	793	795
305	1	2707	1355	[dbj|D17366|STAA	Staphylococcus aureus atl gene for autolysin, complete cds and other ORFs	99	1343	1353
311	1	2628	1315	[gb|L42945|	Staphylococcus aureus lysS and lysR genes, complete cds	98	1314	1314
312	6	7019	7870	[gb|L44017|	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	74	351	852
323	1	1998	1003	[gb|U31175|	Staphylococcus aureus D-specific D-2-hydroxyacid dehydrogenase (adh) gene, complete cds	98	996	996
326	1	1	237	[emb|V00356|SASP	Staphylococcus aureus V8 serine protease gene	100	108	237
338	1	687	368	[emb|X64389|SNLE	S.aureus leuF-P83 gene for F component of leucocidin R	98	259	300
338	2	1828	1088	[emb|X64389|SNLE	S.aureus leuF-P83 gene for F component of leucocidin, R	97	137	741

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	Percent ident	ORF nt length
342	2	579	1734	[gb|U06462]	Staphylococcus aureus SA4 fta2 (fta2) gene, complete cds	100	1176
344	2	517	1248	[emb|V01281|SNU]	S. aureus mRNA for nuclease	98	732
349	1	457	230	[gb|M20393]	S. aureus bacteriophage phi-11 attachment site (attB)	96	172
353	1	1016	516	[gb|M33994]	Staphylococcus aureus prolipoprotein signal peptidase (lsp) gene, complete cds	100	187
353	2	1582	1046	[gb|M33994]	Staphylococcus aureus prolipoprotein signal peptidase (lsp) gene, complete cds	99	537
356	1	3	674	[gb|U20503]	Staphylococcus aureus MIC class II analog gene, complete cds	75	671
361	1	1	903	[gb|L19288]	Staphylococcus aureus phosphatidylinositol-specific phospholipase C (plc) gene, complete cds	98	747
361	2	1103	1507	[gb|L19288]	Staphylococcus aureus phosphatidylinositol-specific phospholipase C (plc) gene, complete cds	97	68
373	1	3	1148	[emb|X62288|SAFE]	S. aureus DNA for penicillin-binding protein 2	99	1146
389	3	1904	1248	[emb|X62282|SATS]	S. aureus target site DNA for IS431 insertion	97	349
400	1	1	540	[emb|X61716|SAHL]	S. aureus hlb gene encoding sphingomyelinase	99	389
400	2	1693	1187	[emb|X13404|SAHL]	Staphylococcus aureus hlb gene for beta-hemolysin	99	178
408	1	1810	1049	[gb|S76213]	esp23-alkaline shock protein 23 (methicillin resistant) (Staphylococcus aureus, 912, Genomic, 1360 nt)	99	163
418	1	2	217	[gb|A1499]	Staphylococcus aureus ORF1, partial cds, ORF2, ORF3, autolysin (atl) genes, complete cds	100	216
418	2	854	639	[dbj|D17366|STAA]	Staphylococcus aureus atl gene for autolysin, complete cds and other ORFs	100	188
421	2	1262	2509	[gb|L43098]	Transposon Tn3404 and insertion sequences IS1181 and IS1182 (from Staphylococcus aureus) DNA	99	1248
422	1	2	325	[gb|K02985]	S. aureus (strain RN450) transposon Tn334 insertion site	96	200
427	1	865	434	[dbj|D28879|STAP]	Staphylococcus aureus gene for penicillin-binding protein 1, complete cds	100	432
427	2	1829	1122	[dbj|D28879|STAP]	Staphylococcus aureus gene for penicillin-binding protein 1, complete cds	100	151
435	1	2	808	[dbj|D86240|D862]	Staphylococcus aureus gene for unknown function and dit operon dltA, dltB, dltC and dltD genes, complete cds	100	556
435	2	832	999	[dbj|D86240|D862]	Staphylococcus aureus gene for unknown function and dit operon dltA, dltB, dltC and dltD genes, complete cds	100	134
436	1	1341	685	[emb|X17688|SAFE]	S. aureus factor essential for expression of methicillin resistance (fema) gene, complete cds, and trpA gene, 3' end	97	657

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	Percent Ident	HSP nt length	ORF nt length
436	2	2403	1657	[emb]N17688[SAPF]	S. aureus factor essential for expression of methicillin resistance (fema) gene, complete cds, and trpA gene, 3' and	100	294	747
442	1	347	1300	[emb]X72700[SAPV]	S. aureus genes for S and F components of Pantone-Valentine leucocidins	86	204	954
445	2	1906	2178	[gb]L010551	Staphylococcus aureus gamma-hemolysin components A, B and C (hlgA, hlgB, hlgC) genes, complete cds	98	187	273
447	1	167	1078	[gb]U197701	Staphylococcus aureus pyrrolidone carboxyl peptidase (pcp) gene, complete cds	100	51	912
447	2	1176	1784	[gb]U197701	Staphylococcus aureus pyrrolidone carboxyl peptidase (pcp) gene, complete cds	96	597	609
454	3	7309	4319	[emb]Z18852[SACF]	S. aureus gene for clumping factor	75	653	2991
472	4	7896	5479	[gb]L252881	Staphylococcus aureus gyrase-like protein alpha and beta subunit (gr1A and gr1B) genes, complete cds	99	2418	2418
472	5	8120	6792	[gb]L252881	Staphylococcus aureus gyrase-like protein alpha and beta subunit (gr1A and gr1B) genes, complete cds	99	1328	1329
475	2	566	889	[emb]X52543[SAAC]	S. aureus agrA, agrB and hld genes	100	76	324
481	4	1922	1560	[emb]X64172[SARP]	S. aureus rplL, orf202, rpsB(rif) and rpsC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	100	250	363
481	5	1244	1534	[emb]X64172[SARP]	S. aureus rplL, orf202, rpsB(rif) and rpsC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	100	224	291
487	2	1388	1188	[gb]HU39941	Staphylococcus aureus prolipoprotein signal peptidase (lsp) gene, complete cds	98	72	201
489	1	2737	1370	[gb]U212211	Staphylococcus aureus hyaluronate lyase (hysA) gene, complete cds	99	1368	1368
503	2	1135	653	[gb]HU39941	Staphylococcus aureus prolipoprotein signal peptidase (lsp) gene, complete cds	100	108	483
511	3	1613	2242	[gb]L140171	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	84	323	630
511	4	3122	2700	[gb]S762131	asp23-alkaline shock protein 23 (methicillin resistant) [Staphylococcus aureus, 912, Genomic, 1360 nt]	96	423	423
520	2	758	1297	[emb]X72014[SAPF]	S. aureus fib gene for fibrinogen-binding protein	99	540	540
520	3	1436	1801	[emb]X72013[SAPF]	S. aureus fib gene for fibrinogen-binding protein	99	221	366
526	1	2150	1092	[dbj]U17366[STAA]	Staphylococcus aureus atl gene for autolysin, complete cds and other ORFs	99	641	1059

TABLE 1

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	percent ident	HSP nt length	ORF nt length
528	2	58	963	gb|L19300|	Staphylococcus aureus DNA sequence encoding three ORFs, complete cds; prophage phi-11 sequence homology, 5' flank	99	260	906
528	3	1098	2870	gb|L19300|	Staphylococcus aureus DNA sequence encoding three ORFs, complete cds; prophage phi-11 sequence homology, 5' flank	99	866	1773
530	1	3	434	gb|U31979|	Staphylococcus aureus chorismate synthase (aroC) and nucleoside diphosphate kinase (ndk) genes, complete cds, dehydroquinase synthase (aroB) and geranylgeranyl pyrophosphate synthetase homolog (gerCC) genes, partial cds	99	432	432
530	2	1211	2395	gb|U31979|	Staphylococcus aureus chorismate synthase (aroC) and nucleoside diphosphate kinase (ndk) genes, complete cds, dehydroquinase synthase (aroB) and geranylgeranyl pyrophosphate synthetase homolog (gerCC) genes, partial cds	91	1185	1185
530	3	2409	2801	gb|U31979|	Staphylococcus aureus chorismate synthase (aroC) and nucleoside diphosphate kinase (ndk) genes, complete cds, dehydroquinase synthase (aroB) and geranylgeranyl pyrophosphate synthetase homolog (gerCC) genes, partial cds	88	381	393
530	4	2690	3484	gb|L05004|	Staphylococcus aureus dehydroquinase synthase (aroB) gene, 3' end cds; 3-phosphohikimate-1-carboxyvinyltransferase (aroH) gene, complete cds; ORF3, complete cds	100	75	795
530	5	3482	4792	gb|L05004|	Staphylococcus aureus dehydroquinase synthase (aroB) gene, 3' end cds; 3-phosphohikimate-1-carboxyvinyltransferase (aroH) gene, complete cds; ORF3, complete cds	99	905	1311
530	6	4790	5380	gb|L05004|	Staphylococcus aureus dehydroquinase synthase (aroB) gene, 3' end cds; 3-phosphohikimate-1-carboxyvinyltransferase (aroH) gene, complete cds; ORF3, complete cds	100	196	591
539	1	3	338	emb|X76490|SACL	S. aureus (bb270) glnA and glnR genes	99	336	336
539	2	336	527	emb|X76490|SACL	S. aureus (bb270) glnA and glnR genes	100	189	192
554	1	727	365	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	100	54	363
554	2	2175	1252	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	99	918	924
554	3	1574	1374	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	96	122	201
584	2	1019	705	gb|U21221|	Staphylococcus aureus hyaluronate lyase (hyla) gene, complete cds	99	306	315
587	3	1475	4288	emb|Z18852|SACF	S. aureus gene for clumping factor	98	2388	2814
598	1	3841	1953	dbj|D28879|STAP	Staphylococcus aureus gene for penicillin-binding protein 1, complete cds	99	1873	1929

TABLE 1

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	percent ident	HSP nt length	ORF nt length
605	1	2	745	[dbj|D86240|D862]	Staphylococcus aureus gene for unknown function and dit operon dltA, dltB, dltC and dltD genes, complete cds	98	338	744
609	1	1628	816	[emb|X76490|SAGU]	S. aureus (b270) glnA and glnR genes	100	495	813
614	1	1280	642	[gb|H32103]	Staphylococcus aureus lac repressor (lacI) gene, complete cds and lacA repressor (lacA), partial cds	99	639	639
626	1	2508	1255	[gb|H63176]	Staphylococcus aureus helicase required for T181 replication (pcrA) gene, complete cds	100	225	1254
626	2	3315	2284	[gb|H63176]	Staphylococcus aureus helicase required for T181 replication (pcrA) gene, complete cds	99	838	1032
629	1	1999	1001	[emb|X17688|SAFE]	S. aureus factor essential for expression of methicillin resistance (fema) gene, complete cds, and trpA gene, 3' end	99	990	999
629	2	1407	1195	[emb|X17688|SAFE]	S. aureus factor essential for expression of methicillin resistance (fema) gene, complete cds, and trpA gene, 3' end	98	194	213
631	2	5126	3228	[emb|Z18852|SACF]	S. aureus gene for clumping factor	82	489	1899
632	1	3	551	[emb|Z10588|SAST]	S. aureus (RM4220) genes for potential ABC transporter and potential membrane spanning protein	99	549	549
632	2	529	1323	[emb|Z10588|SAST]	S. aureus (RM4220) genes for potential ABC transporter and potential membrane spanning protein	99	795	795
651	1	1909	1070	[gb|L19300]	Staphylococcus aureus DNA sequence encoding three ORFs, complete cds; prophage phi-11 sequence homology, 5' flank	99	478	840
657	2	1800	1105	[gb|L14017]	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	84	456	696
662	1	908	456	[emb|X13404|SAHL]	Staphylococcus aureus hlb gene for beta-hemolysin	100	369	453
662	2	230	475	[emb|X13404|SAHL]	Staphylococcus aureus hlb gene for beta-hemolysin	100	246	246
662	3	746	1399	[emb|X13404|SAHL]	Staphylococcus aureus hlb gene for beta-hemolysin	99	653	654
682	1	956	480	[gb|H63177]	S. aureus sigma factor (plac) gene, complete cds	100	136	477
685	1	1182	592	[gb|U65000]	Staphylococcus aureus type-I signal peptidase SpsA (spsA) gene, and type-I signal peptidase SpsB (spsB) gene, complete cds	98	534	591
685	2	1716	1153	[gb|U65000]	Staphylococcus aureus type-I signal peptidase SpsA (spsA) gene, and type-I signal peptidase SpsB (spsB) gene, complete cds	96	564	564
697	1	3	527	[gb|H63177]	S. aureus sigma factor (plac) gene, complete cds	100	195	525
697	2	485	784	[gb|H63177]	S. aureus sigma factor (plac) gene, complete cds	97	280	300

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	Percent Ident	HSP nt length	ORF nt length
710	1	15	503	[dbj|D86240|D862	Staphylococcus aureus gene for unknown function and dit operon dltA, dltB, dltC and dltD genes, complete cds	99	217	489
733	1	26	205	[gb|H80252]	Staphylococcus aureus norA199 gene (which mediates active efflux of fluoroquinolones), complete cds	97	160	180
741	1	1736	1197	[dbj|D81951|STAL	Staphylococcus aureus DNA for LukM component, LukP-PV like component, complete cds	81	522	540
752	1	1	636	[emb|Y00356|SASP	Staphylococcus aureus V8 serine protease gene	99	618	636
752	2	588	956	[emb|Y00356|SASP	Staphylococcus aureus V8 serine protease gene	99	360	369
756	1	1108	709	[emb|X01685|SATO	Staphylococcus aureus (Wood 46) gene for alpha-toxin	98	567	600
777	1	1582	950	[emb|Z49245|SA42	S. aureus partial sod gene for superoxide dismutase	99	429	633
780	1	1111	557	[gb|U20503]	Staphylococcus aureus MHC class II analog gene, complete cds	86	550	555
784	1	73	687	[gb|U63529]	Staphylococcus aureus novel antigen gene, complete cds	99	568	615
797	1	182	544	[dbj|D14711|STAH	Staphylococcus aureus HSP10 and HSP60 genes	98	363	363
798	1	532	102	[emb|X58434|SAPD	S. aureus pdhB, pdhC and pdhD genes for pyruvate decarboxylase, dihydrodipicolinate acetyltransferase and dihydrodipicolinate dehydrogenase	95	196	231
823	1	3	467	[gb|S77055]	recP cluster: dnaA-replisome assembly protein...gyrB-DNA gyrase beta subunit (Staphylococcus aureus, Y8886, Genomic, 3573 nt)	99	156	465
848	1	348	175	[gb|L25288]	Staphylococcus aureus gyrase-like protein alpha and beta subunit (gria and griB) genes, complete cds	99	174	174
848	2	476	318	[gb|L25288]	Staphylococcus aureus gyrase-like protein alpha and beta subunit (gria and griB) genes, complete cds	100	131	159
866	1	792	397	[emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L27/L32, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	99	395	396
883	1	1	285	[dbj|D90119|STAN	S. aureus nraA gene	99	131	285
884	1	606	334	[emb|X32543|SAAG	S. aureus agrA, agrB and hld genes	98	265	273
884	2	716	522	[emb|X32543|SAAG	S. aureus agrA, agrB and hld genes	100	195	195
912	2	517	681	[emb|Z30388|SAST	S. aureus (RM220) genes for potential ABC transporter and potential membrane spanning protein	99	163	165
917	1	2	265	[gb|H64724]	S. aureus tagtose 6-phosphate isomerase gene, complete cds	99	247	264
917	2	238	356	[gb|H64724]	S. aureus tagtose 6-phosphate isomerase gene, complete cds	95	147	159
918	1	2426	1215	[emb|X93205|SAPT	S. aureus ptaH and ptaI genes	99	1212	1212

TABLE I

S. aureus - Contig regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	percent ident	HSP nt length	ORF nt length
967	1	1	411	[dbj|U90119|STAN	S. aureus nraA gene	97	395	411
991	1	672	337	[emb|X52543|SAG	S. aureus agrA, agrB and hld genes	99	336	336
1000	1	1117	845	[gb|U14017]	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	78	190	273
1001	1	498	265	[dbj|D86240|D862	Staphylococcus aureus gene for unknown function and dlt operon dltA, dltB, dltC and dltD genes, complete cds	99	234	234
1010	1	1	285	[gb|U21221]	Staphylococcus aureus hyaluronate lyase (hysA) gene, complete cds	99	224	285
1046	1	656	330	[emb|X72700|SAPV	S. aureus genes for S and P components of Pantone-Valentine leucocidins	85	205	327
1060	1	480	286	[emb|X58434|SAPD	S. aureus pdhA, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	99	180	195
1073	1	1176	589	[gb|K02985]	S. aureus (strain RN450) transposon Tn554 insertion site	100	131	588
1079	1	3	230	[dbj|D86240|D862	Staphylococcus aureus gene for unknown function and dlt operon dltA, dltB, dltC and dltD genes, complete cds	99	228	228
1079	2	218	484	[dbj|D86240|D862	Staphylococcus aureus gene for unknown function and dlt operon dltA, dltB, dltC and dltD genes, complete cds	100	267	267
1079	3	400	645	[dbj|U86240|na62	Staphylococcus aureus gene for unknown function and dlt operon dltA, dltB, dltC and dltD genes, complete cds	100	186	186
1092	1	289	146	[emb|X58434|SAPD	S. aureus pdhA, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	98	124	144
1143	1	1	243	[gb|U63177]	S. aureus sigma factor (placI) gene, complete cds	99	243	243
1157	1	2	136	[emb|248003|SADN	S. aureus gene for DNA polymerase III	97	127	135
1189	1	720	361	[gb|S74031]	[nraA-nraA (ISP794)] Staphylococcus aureus, NCTC 8325, Insertion, 1820 nt	99	360	360
1190	1	2	283	[gb|U21854]	S. aureus agr gene encoding an accessory gene regulator protein, complete cds	100	282	282
1190	2	1127	888	[emb|X52543|SAG	S. aureus agrA, agrB and hld genes	100	240	240
1225	1	2	163	[emb|X17679|SACO	Staphylococcus aureus coa gene for coagulase	97	124	162
1243	1	2	529	[dbj|D86240|D862	Staphylococcus aureus gene for unknown function and dlt operon dltA, dltB, dltC and dltD genes, complete cds	99	495	528
1244	1	1	210	[gb|S74031]	[nraA-nraA (ISP794)] Staphylococcus aureus, NCTC 8325, Insertion, 1820 nt	100	210	210
1301	1	41	472	[emb|X76490|CAGL	S. aureus (bb270) glpA and glpR genes	99	299	432

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	Percent ident	HSP nt length	ORF nt length
1315	1	18	326	emb|X64172|SARP	S.aureus rplL, orf202, rplA(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	98	277	309
1519	1	2	175	dbj|D28879|STAP	Staphylococcus aureus gene for penicillin-binding protein 1, complete cds	98	139	174
1663	1	1346	675	dbj|D46240|D862	Staphylococcus aureus gene for unknown function and dit operon dltA, dltB, dltC and dltD genes, complete cds	98	672	672
1797	1	644	324	gb|U73374|	Staphylococcus aureus type 8 capsule genes, capA, capB, capC, capD, capE, capF, capG, capH, capI, capJ, capK, capL, capM, capN, capO, capP, complete cds	99	321	321
1857	1	1	192	gb|H90536|	Staphylococcus aureus alpha-hemolysin gene, 3' end	98	192	192
1923	1	2	181	emb|X17688|SAFE	S.aureus factor essential for expression of methicillin resistance (femA) gene, complete cds, and trpA gene, 3' end	100	180	180
1957	1	2	346	gb|U60589|	Staphylococcus aureus novel antigen gene, complete cds	99	345	345
1988	1	1	402	dbj|D86240|D862	Staphylococcus aureus gene for unknown function and dit operon dltA, dltB, dltC and dltD genes, complete cds	100	402	402
2100	1	414	208	gb|H63177|	S.aureus sigma factor (plac) gene, complete cds	99	207	207
2199	1	1	402	gb|U66664|	Staphylococcus aureus DNA fragment with class II promoter activity	99	131	402
2337	1	308	156	emb|X17688|SAFE	S.aureus factor essential for expression of methicillin resistance (femA) gene, complete cds, and trpA gene, 3' end	99	153	153
2891	1	2	400	gb|L25426|	Staphylococcus aureus penicillin-binding protein 2 (pbp2) gene, complete cds	99	399	399
2950	1	778	398	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP70; HSP40; ORF35, complete cds	100	358	381
2971	1	3	398	gb|U51132|	Staphylococcus aureus o-succinylbenzoic acid CoA ligase (heme), and o-succinylbenzoic acid synthetase (hmc) genes, complete cds	97	272	396
2978	1	618	328	gb|J31979|	Staphylococcus aureus chorismate synthase (aroC) and nucleoside diphosphate kinase (hdk) genes, complete cds, dehydrogenase synthase (aroB) and geranylgeranyl pyrophosphate synthase homolog (gerCC) genes, partial cds	98	250	291
2985	1	832	464	emb|X17679|SACO	Staphylococcus aureus coa gene for coagulase	98	347	369
3006	1	2170	1784	gb|U11779|	Staphylococcus aureus methicillin-resistant ATCC 33952 clone RN4380 16S-23S rRNA spacer region	87	82	387
3008	1	474	238	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP70; HSP40; ORF35, complete cds	88	178	237
3008	2	451	281	dbj|D30690|STAN	Staphylococcus aureus genes for ORF37; HSP70; HSP40; ORF35, complete cds	97	120	171

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	percent ident	HSP length	ORF nt length
3011	1	793	398	[emb]X62952|SAFN	S. aureus fnbB gene for fibronectin binding protein B	93	72	396
3019	1	2	235	[gb]J03479|	S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds	97	234	234
3023	1	81	233	[gb]U06451|	Staphylococcus aureus proline permease homolog (putP) gene, complete cds	87	100	153
3029	1	90	287	[gb]U51133|	Staphylococcus aureus phosphoenolpyruvate carboxylase (pckA) gene, complete cds	100	135	198
3039	1	18	164	[gb]U51133|	Staphylococcus aureus phosphoenolpyruvate carboxylase (pckA) gene, complete cds	97	115	147
3039	2	70	327	[gb]U51133|	Staphylococcus aureus phosphoenolpyruvate carboxylase (pckA) gene, complete cds	77	183	258
3056	1	3	215	[emb]X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	99	213	213
3059	1	1	261	[db]J030690|STAN	Staphylococcus aureus genes for ORF37, HSP20, HSP70, HSP40, ORF35, complete cds	98	234	261
3073	1	27	284	[gb]U06451|	Staphylococcus aureus proline permease homolog (putP) gene, complete cds	99	229	258
3074	1	2	397	[emb]X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	96	250	396
3088	1	3	239	[db]J086727|DR67	Staphylococcus aureus DNA for DNA polymerase III, complete cds	95	215	237
3097	1	444	244	[emb]Z48003|SARH	S. aureus gene for DNA polymerase III	97	160	201
3102	1	307	155	[gb]J03479|	S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds	97	142	153
3121	1	568	398	[emb]X58434|SAPD	S. aureus pdhA, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	100	88	171
3125	1	463	233	[emb]X89233|SAMP	S. aureus DNA for rpoC gene	98	192	231
3133	1	2	175	[emb]Z18952|SACP	S. aureus gene for clumping factor	96	154	174
3160	1	420	211	[db]J010489|STAC	Staphylococcus aureus genes for DNA gyrase A and B, complete cds	89	197	210
3176	1	1	378	[emb]X58434|SAPD	S. aureus pdhA, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	96	91	378
3192	1	420	211	[gb]J03479|	S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds	98	72	210
3210	1	3	143	[gb]J06714|	Staphylococcus aureus peptidoglycan hydrolase gene, complete cds	96	141	141

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	Percent ident	ORF nt length
3232	3	2106	1282	gb|U14017|	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	71	825
333A	1	2	394	emb|X89233|SARP	S. aureus DNA for rpoC gene	99	393
3343	1	392	634	gb|U11530|	Staphylococcus aureus transfer RNA sequence with two rRNAs	99	243
3355	1	637	320	emb|Z18852|SACF	S. aureus gene for clumping factor	99	318
3359	1	3	182	emb|X17679|SACO	Staphylococcus aureus coa gene for coagulase	100	180
3359	2	95	313	emb|X17679|SACO	Staphylococcus aureus coa gene for coagulase	98	174
3363	1	278	141	gb|U35773|	Staphylococcus aureus prol: protein diacylglycerol transferase (lgt) gene, complete cds	100	79
3363	2	527	363	gb|U35773|	Staphylococcus aureus prol: protein diacylglycerol transferase (lgt) gene, complete cds	98	162
3366	1	3	422	emb|X16457|SAST	Staphylococcus aureus gene for staphylocoagulase	98	175
3388	1	2	262	gb|U43098|	Transposon Tn5404 and insertion sequences IS1181 and IS1182 (from Staphylococcus aureus) DNA	99	253
3393	1	1	350	gb|U03479|	S. aureus enzyme III-lac (lacF), enzyme II-lac (lacR), and phospho-beta-galactosidase (lacG) genes, complete cds	99	345
3600	1	758	381	emb|Z18852|SACF	S. aureus gene for clumping factor	72	346
3602	1	788	396	emb|Z18852|SACF	S. aureus gene for clumping factor	98	319
3656	1	1013	528	emb|Z18852|SACF	S. aureus gene for clumping factor	84	403
3682	1	3	236	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	100	231
3682	2	224	415	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	100	112
3693	1	758	423	emb|X62992|SAFN	S. aureus fnbB gene for fibronectin binding protein B	100	229
3702	1	593	354	gb|U11530|	Staphylococcus aureus transfer RNA sequence with two rRNAs	94	81
3725	1	924	463	emb|Z18852|SACF	S. aureus gene for clumping factor	71	367
3761	1	809	450	gb|U14017|	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	85	333
3767	1	1	402	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	98	387

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	percent ident	ORF nt length
3775	1	2	286	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	100	227
3786	1	456	229	dbj|D10489|STAG	Staphylococcus aureus genes for DNA gyrase A and B, complete cds	100	204
3786	2	542	366	dbj|D10489|STAG	Staphylococcus aureus genes for DNA gyrase A and B, complete cds	95	123
3798	1	3	251	emb|X17679|SACO	Staphylococcus aureus coa gene for coagulase	99	249
3813	1	793	398	gb|J04131|	S. aureus fibronectin-binding protein (fnbA) mRNA, complete cds	98	396
3819	1	184	402	emb|X68425|SA23	S. aureus gene for 23S rRNA	99	161
3844	1	912	468	gb|U48826|	Staphylococcus aureus elastin binding protein (ebpS) gene, complete cds	87	204
3845	1	1	381	emb|X58434|SARD	S. aureus pddB, pddC and pddD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	94	356
3856	1	798	400	gb|L14017|	Staphylococcus aureus methicillin-resistance protein (mecA) gene and unknown ORF, complete cds	76	192
3859	1	1049	573	emb|Z18852|SACF	S. aureus gene for clumping factor	85	367
3871	1	650	337	gln|N76714|	Staphylococcus aureus peptidoglycan hydrolase gene, complete cds	100	299
3876	1	2	253	dbj|D10489|STAG	Staphylococcus aureus genes for DNA gyrase A and B, complete cds	100	217
3877	1	572	288	gb|J03479|	S. aureus enzyme III-lac (lacP), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds	97	209
3878	1	1	237	emb|X58434|SAPU	S. aureus pddB, pddC and pddD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	96	155
3888	1	3	173	emb|X16457|SAST	Staphylococcus aureus gene for staphylocoagulase	98	171
3893	1	1	183	emb|X89233|SARP	S. aureus DNA for rpoC gene	100	170
3893	2	181	357	emb|X89233|SARP	S. aureus DNA for rpoC gene	98	79
3894	1	3	485	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	99	450
3895	1	436	420	gln|J04131|	S. aureus fibronectin-binding protein (fnbA) mRNA, complete cds	99	411
3905	1	48	239	gln|L05004|	Staphylococcus aureus dehydroquinase synthase (aroB) gene, 3' end cds; 3-phosphoshikimate-1-carboxyvinyltransferase (aroA) gene, complete cds; ORF3, complete cds	100	159
3905	2	188	400	gln|L05004|	Staphylococcus aureus dehydroquinase synthase (aroB) gene, 3' end cds; 3-phosphoshikimate-1-carboxyvinyltransferase (aroA) gene, complete cds; ORF3, complete cds	97	88

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	percent ident	HSP nt length	ORF nt length
3910	1	3	359	emb|X58434|SAPD	S. aureus pdhB, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	99	278	357
3915	1	1	330	gb|U14017|	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	75	175	330
3964	1	691	347	emb|Z48003|SADN	S. aureus gene for DNA polymerase III	100	295	345
4007	1	199	390	emb|X16457|SAST	Staphylococcus aureus gene for staphylocoagulase	98	163	192
4036	1	3	371	dbj|U10489|STAG	Staphylococcus aureus genes for DNA gyrase A and B, complete cds	99	339	369
4046	1	692	348	emb|Z18852|SACF	S. aureus gene for clumping factor	87	221	345
4060	1	1	375	emb|Z18852|SACF	S. aureus gene for clumping factor	96	271	375
4061	1	860	432	emb|Z48003|SADN	S. aureus gene for DNA polymerase III	99	429	429
4062	1	606	304	gb|U14017|	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	75	198	303
4085	1	58	402	gb|U11786|	Staphylococcus aureus methicillin-resistance ATCC 33953 clone RMR42 165-235 RNA spacer region	98	127	345
4088	1	2	301	gb|U43098|	Transposon Tn5404 and insertion sequences IS1181 and IS1182 (from Staphylococcus aureus) DNA	99	227	300
4093	1	2	277	emb|X58434|SAPD	S. aureus pdhB, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	99	276	276
4097	1	1	402	emb|Z18852|SACF	S. aureus gene for clumping factor	74	307	402
4116	1	22	402	gb|U05004|	Staphylococcus aureus dihydroquinone synthase (aroH) gene, 3' end cds; 3-phosphoshikimate-3-carboxyvinyltransferase (aroA) gene, complete cds; ORF, complete cds	98	157	381
4125	1	240	401	gb|U73374|	Staphylococcus aureus type 8 capsule genes, cap8A, cap8B, cap8C, cap8D, cap8E, cap8F, cap8G, cap8H, cap8I, cap8J, cap8K, cap8L, cap8M, cap8N, cap8O, cap8P, complete cds	100	86	162
4149	1	35	247	gb|J04151|	S. aureus fibronectin-binding protein (fmbA) mRNA, complete cds	99	200	213
4151	1	629	366	gb|U14017|	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	87	150	264
4154	1	736	398	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	99	297	357
4179	1	1	294	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	98	240	294

TABLE 1

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	percent ident	HSP nt length	ORF nt length
4203	1	1	255	emb|X89233|SARP	S. aureus DNA for rpoC gene	99	239	255
4206	1	1	303	emb|Z18832|SACF	S. aureus gene for clumping factor	100	236	303
4206	2	195	344	emb|Z18852|SACF	S. aureus gene for clumping factor	95	65	150
4208	1	108	314	emb|X58434|SAPD	S. aureus pdhB, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolypoamide acetyltransferase and dihydrolypoamide dehydrogenase	89	76	207
4216	1	656	330	emb|X58434|SAPD	S. aureus pdhB, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolypoamide acetyltransferase and dihydrolypoamide dehydrogenase	98	326	327
4226	1	594	298	gb|L11530|	Staphylococcus aureus transfer RNA sequence with two rRNAs	97	132	297
4260	1	216	383	gb|U11784|	Staphylococcus aureus methicillin-resistant ATCC 33952 clone RN460 16S-23S rRNA spacer region	83	141	168
4272	1	355	179	emb|Z48003|SAUN	S. aureus gene for DNA polymerase III	100	164	177
4276	1	4	177	emb|X16457|SAST	Staphylococcus aureus gene for staphylocoagulase	99	150	174
4277	1	1	270	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	99	265	270
4282	1	691	377	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	98	282	315
4291	1	379	191	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	99	183	189
4295	1	3	329	emb|X16457|SAST	Staphylococcus aureus gene for staphylocoagulase	94	144	327
4313	1	435	280	gb|L11530|	Staphylococcus aureus transfer RNA sequence with two rRNAs	100	94	156
4315	1	3	185	gb|J03479|	S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds	100	158	183
4315	2	101	310	gb|J03479|	S. aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds	98	75	210
4327	1	1	294	gb|L43098|	Transposon Tn5404 and insertion sequences IS1181 and IS1182 (from Staphylococcus aureus) DNA	98	294	294
4360	1	603	319	gb|U02910|	Staphylococcus aureus ATCC 25923 16S rRNA gene, partial sequence	100	116	285
4364	1	3	146	emb|X64172|SARP	S. aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	95	140	144
4388	1	167	310	emb|X62592|SAFN	S. aureus fnbB gene for fibronectin binding protein B	73	119	144

TABLE I

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	percent ident	ORF nt length
4401	1	2	313	emb|X62992|SAPN	S.aureus fnbB gene for fibronectin binding protein B	97	243
4421	1	36	281	dbj|D12572|STA2	Staphylococcus aureus rna gene for 23S ribosomal RNA	100	112
4426	1	3	293	emb|Z18852|SACF	S.aureus gene for clumping factor	85	185
4428	1	493	248	emb|X64172|SARP	S.aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	100	139
4462	1	2	271	emb|X64172|SARP	S.aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	99	270
4466	1	1	240	emb|Z18852|SACF	S.aureus gene for clumping factor	99	231
4469	1	1	312	gb|J03479|	S.aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds	99	265
4485	1	3	263	gb|L43098|	Transposon Tn5404 and insertion sequences IS1181 and IS1182 (from Staphylococcus aureus) DNA	98	259
4492	1	74	400	gb|MB6227|	Staphylococcus aureus DNA gyrase B subunit (gyrB) RecF homologue (recF) and DNA gyrase A subunit (gyrA) gene, complete cds	85	104
4497	1	515	269	emb|Z18852|SACF	S.aureus gene for clumping factor	99	213
4529	1	2	172	emb|X64172|SARP	S.aureus rplL, orf202, rpoB(rif) and rpoC genes for ribosomal protein L7/L12, hypothetical protein ORF202, DNA-directed RNA polymerase beta & beta' chains	100	151
4547	1	1	300	emb|X62992|SAPN	S.aureus fnbB gene for fibronectin binding protein B	100	157
4554	1	318	160	emb|Z18852|SACF	S.aureus gene for clumping factor	84	126
4565	1	9	227	emb|Z18852|SACF	S.aureus gene for clumping factor	84	213
4569	1	79	222	emb|Z18852|SACF	S.aureus gene for clumping factor	98	127
4608	1	22	216	emb|X58434|SAPD	S.aureus pdhB, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	92	168
4614	1	464	234	emb|Z18852|SACF	S.aureus gene for clumping factor	86	169
4623	1	105	302	gb|J04151|	S.aureus fibronectin-binding protein (fnbA) mRNA, complete cds	99	152
4632	1	18	206	gb|J03479|	S.aureus enzyme III-lac (lacF), enzyme II-lac (lacE), and phospho-beta-galactosidase (lacG) genes, complete cds	98	183
4666	1	1	222	emb|Z18852|SACF	S.aureus gene for clumping factor	84	100
4687	1	2	166	gb|J04151|	S.aureus fibronectin-binding protein (fnbA) mRNA, complete cds	98	156

TABLE 1

S. aureus - Coding regions containing known sequences

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	match gene name	percent ident	HSP nt length	ORF nt length
4695	1	313	158	U14017	Staphylococcus aureus methicillin-resistance protein (mecR) gene and unknown ORF, complete cds	75	155	156
4701	1	1	153	emb|X58434|SAPD	S. aureus pdhB, pdhC and pdhD genes for pyruvate decarboxylase, dihydrolipoamide acetyltransferase and dihydrolipoamide dehydrogenase	98	103	153

TABLE I

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	RefSeq gene name	% sim	% ident	Length (nt)
20	6	5089	4679	gi|511839	ORF1 (Staphylococcus bacteriophage phi 11)	100	100	411
149	3	2032	1577	pir|B49703|B497	int gene activator Rint - bacteriophage phi 11	100	100	456
149	5	2109	1912	gi|166161	Bacteriophage phi-11 int gene activator (Staphylococcus acteriophage phi 11)	100	100	198
349	2	558	409	gi|166159	integrase (int) (Staphylococcus bacteriophage phi 11)	100	100	150
398	1	1372	707	gi|166159	integrase (int) (Staphylococcus bacteriophage phi 11)	100	99	666
398	2	783	1001	gi|455128	excisionase (Xis) (Staphylococcus bacteriophage phi 11)	100	100	219
502	4	1914	1744	gi|1204912	H. influenzae predicted coding region HI0640 (Haemophilus influenzae)	100	71	171
849	1	2	262	gi|1373002	polyprotein (Bean common mosaic virus)	100	46	261
1349	1	277	140	gi|143359	protein synthesis initiation factor 2 (infB) (Bacillus subtilis) gi|49319	100	82	138
2880	1	21	308	gi|862933	protein kinase C inhibitor-1 (Homo sapiens)	100	98	288
3085	1	428	216	gi|1354211	PER112-like protein (Bacillus subtilis)	100	100	213
4168	2	571	398	gi|1354211	PER112-like protein (Bacillus subtilis)	100	100	174
331	1	2	247	gi|426473	musC gene product (Staphylococcus carnosus)	98	95	246
207	2	1272	1463	gi|460259	enolase (Bacillus subtilis)	97	90	192
331	2	395	850	gi|581638	111 protein (Staphylococcus carnosus)	97	71	456
366	1	39	215	gi|166161	Bacteriophage phi-11 int gene activator (Staphylococcus acteriophage phi 11)	97	95	177
680	3	718	936	gi|426473	musC gene product (Staphylococcus carnosus)	97	97	219
3578	1	284	144	gi|1339950	large subunit of NADH-dependent glutamate synthase (Plectononema boryanum)	97	79	141
157	1	321	518	gi|1022726	unknown (Staphylococcus haemolyticus)	96	88	198
205	23	16470	16147	gi|1145302	S10 (Bacillus subtilis)	96	91	324
3919	1	48	401	gi|971784	Clp-like ATP-dependent protease binding subunit (Bos taurus)	96	81	354
4133	1	810	417	gi|1022726	unknown (Staphylococcus haemolyticus)	96	84	414
4168	1	708	355	gi|1354211	PER112-like protein (Bacillus subtilis)	96	95	354
4207	1	312	157	gi|402031	similar to triethylamine DH (Mycoplasma capricolum) pir|549950|549950 probable triethylamine dehydrogenase (EC 3.99.7) - Mycoplasma capricolum (SOC3) (fragment)	96	86	156

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
4227	2	152	331	gi|871786	Cip-like ATP-dependent protease binding subunit (Bos taurus)	96	81	180
4416	1	570	286	gi|1022726	unknown (Staphylococcus haemolyticus)	96	84	285
22	1	858	430	gi|511070	ureG (Staphylococcus xyloosus)	95	88	429
22	7	4362	4036	gi|581787	urease gamma subunit (Staphylococcus xyloosus)	95	79	327
82	6	8794	9114	pir|JC0008|JC00	ribosomal protein S7 - Bacillus stearothermophilus	95	83	321
154	9	9280	7838	gi|1354211	PEP112-like protein (Bacillus subtilis)	95	92	1443
186	3	2798	2055	gi|1514656	serine O-acetyltransferase (Staphylococcus xyloosus)	95	87	744
205	5	4406	4014	gi|142462	ribosomal protein S11 (Bacillus subtilis)	95	85	393
205	7	5017	4793	gi|142459	initiation factor 1 (Bacillus subtilis)	95	84	225
205	21	11365	10991	gi|1044974	ribosomal protein L14 (Bacillus subtilis)	95	93	375
259	5	7288	6644	ap|P07995|YSEA_	HYPOTHEICAL PROTEIN IN SECA 5' REGION (ORF1) (FRAGMENT)	95	85	645
302	3	795	1097	gi|40186	homologous to E.coli ribosomal protein L27 (Bacillus subtilis) |i143592 L27 ribosomal protein (Bacillus subtilis) |r(C21895|C21895 ribosomal protein L27 - Bacillus subtilis |P05657|RL27_BACSU 50S RIBOSOMAL PROTEIN L27 (BL30) (BL24) |i40175 L24 gene prod	95	89	303
310	1	579	1523	gi|1177684	chorismate mutase (Staphylococcus xyloosus)	95	92	945
414	1	2	163	pir|C48396|C483	ribosomal protein L34 - Bacillus stearothermophilus	95	90	162
4105	2	125	277	gi|1276841	glutamate synthase (GOGAT) (Porphyra purpurea)	95	86	153
22	2	1028	723	gi|511069	ureP (Staphylococcus xyloosus)	94	91	306
22	5	5046	3310	gi|410516	urease alpha subunit (Staphylococcus xyloosus)	94	85	1737
60	4	815	1372	gi|666116	glucose kinase (Staphylococcus xyloosus)	94	87	558
205	18	10012	9536	gi|1044978	ribosomal protein S8 (Bacillus subtilis)	94	78	477
326	4	3378	2542	gi|557492	dihydroxynaphthoic acid (DHNA) synthetase (Bacillus subtilis) |gi|143186 dihydroxynaphthoic acid (DHNA) synthetase (Bacillus subtilis)	94	85	837
414	3	737	955	gi|467386	thiophen and furan oxidation (Bacillus subtilis)	94	77	219
426	3	2260	1823	gi|1263908	putative (Staphylococcus epidermidis)	94	87	438
534	1	2	355	gi|633650	enzyme II (mannitol) (Staphylococcus carnosus)	94	84	354
1017	1	2	229	gi|149435	putative (Lactococcus lactis)	94	73	228
3098	1	330	184	gi|413952	lpa-28d gene product (Bacillus subtilis)	94	50	147

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
3232	1	630	316	gi|1022725	unknown [Staphylococcus haemolyticus]	94	84	315
42	5	2089	2259	pir|B48396|B483	ribosomal protein L33 - Bacillus stearothermophilus	93	81	171
101	2	1745	1383	gi|155345	arsenic efflux pump protein [Plasmid pSK267]	93	82	363
205	24	12227	11865	sp|P14577|RL16_	50S RIBOSOMAL PROTEIN L16	93	83	363
259	4	8291	5673	gi|499335	isecA protein [Staphylococcus carnosus]	93	85	2619
275	1	2226	1114	gi|633650	enzyme II (mannitol) [Staphylococcus carnosus]	93	86	1113
444	6	6207	5773	gi|1022726	unknown [Staphylococcus haemolyticus]	93	81	435
491	1	152	622	gi|46912	ribosomal protein L13 [Staphylococcus carnosus]	93	88	471
607	6	1674	2033	gi|1022726	unknown [Staphylococcus haemolyticus]	93	83	360
653	1	973	488	gi|580890	translation initiation factor IF3 (AA 1-172) [Bacillus stearothermophilus]	93	77	486
1864	1	3	194	gi|306553	ribosomal protein small subunit [Homo sapiens]	93	93	192
2997	1	28	300	gi|443390	carbamyl phosphate synthetase [Bacillus subtilis]	93	82	273
3232	2	907	596	gi|1022725	unknown [Staphylococcus haemolyticus]	93	84	312
3761	2	794	621	gi|1022725	unknown [Staphylococcus haemolyticus]	93	88	174
16	1	3	374	gi|142781	putative cytoplasmic protein; putative [Bacillus subtilis] sp|P37936|OVR4_BAC50 EXCINUCLEASE ABC SUBUNIT B (DNA PROTEIN) FRAGMENT	92	83	372
31	7	5915	6124	gi|1136430	KIAA0185 protein [Homo sapiens]	92	46	210
56	19	26483	27391	gi|467401	unknown [Bacillus subtilis]	92	80	909
69	6	5882	6130	gi|530200	trophoblastin [Ovis aries]	92	53	249
145	3	2568	2038	gi|1022725	unknown [Staphylococcus haemolyticus]	92	80	531
171	3	2760	2362	gi|517475	D-amino acid transaminase [Staphylococcus haemolyticus]	92	86	399
205	12	7495	6962	gi|49189	secY gene product [Staphylococcus carnosus]	92	85	534
205	19	10812	10255	gi|1044976	ribosomal protein L5 [Bacillus subtilis]	92	82	558
219	1	710	337	gi|1303812	YqeV [Bacillus subtilis]	92	88	354
344	3	1575	1805	gi|1405474	CspC protein [Bacillus cereus]	92	85	231
699	1	20	361	gi|413959	lpa-75d gene product [Bacillus subtilis]	92	81	362
1343	1	2	160	pir|A45434|A454	ribosomal protein L19 - Bacillus stearothermophilus	92	84	159

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
1958	1	524	264	gi|407908	EF1acr [Staphylococcus xyloosus]	92	80	261
3578	2	718	386	gi|1339950	large subunit of NADH-dependent glutamate synthase [Plectonessa boryanum]	92	78	333
3585	1	644	324	gi|1339950	large subunit of NADH-dependent glutamate synthase [Plectonessa boryanum]	92	81	321
3640	1	4	402	gi|1022726	unknown [Staphylococcus haemolyticus]	92	81	399
4362	1	14	178	gi|450688	hcdm gene of Ecopri1 gene product [Escherichia coli] pir[S18437]S18437 hcdm protein - Escherichia coli pir[S09629]S09629 hypothetical protein A - Escherichia coli (S09 40-520)	92	76	165
4446	1	358	182	gi|1022725	unknown [Staphylococcus haemolyticus]	92	82	177
4549	1	462	232	gi|1022726	unknown [Staphylococcus haemolyticus]	92	80	231
4626	1	3	224	gi|1022725	unknown [Staphylococcus haemolyticus]	92	84	222
2	4	3880	4531	gi|535349	CodM [Bacillus subtilis]	91	74	552
28	1	2	1126	gi|1001376	hypothetical protein (Synchocystis sp.)	91	78	1125
60	5	1354	1701	gi|1226043	orf2 downstream of glucose kinase [Staphylococcus xyloosus]	91	80	348
101	1	1989	1036	gi|150728	arsenic efflux pump protein [Plasmid p158]	91	80	954
187	2	412	1194	gi|142559	ATP synthase alpha subunit [Bacillus megaterium]	91	79	783
205	22	11579	11298	gi|40149	S17 protein (AA 1-87) [Bacillus subtilis]	91	83	282
206	7	8184	10262	gi|1072418	glcA gene product [Staphylococcus carnosus]	91	83	2079
306	2	3885	2326	gi|143012	OMP synthetase [Bacillus subtilis]	91	78	1560
306	3	5319	3826	gi|467399	UMP dehydrogenase [Bacillus subtilis]	91	79	1494
310	3	2194	3207	gi|1177685	ccpA gene product [Staphylococcus xyloosus]	91	81	1014
343	4	2974	3150	gi|949974	sucrose repressor [Staphylococcus xyloosus]	91	82	177
480	3	1606	3042	gi|433991	ATP synthase subunit beta [Bacillus subtilis]	91	85	1437
536	3	2026	1280	gi|143366	adenylosuccinate lyase [Bacillus subtilis]	91	79	747
552	1	1064	615	gi|297874	fructose-bisphosphate aldolase [Bacillus subtilis] pir[C39326]W28SDS	91	79	450
637	1	1	1536	gi|143597	CTP synthetase [Bacillus subtilis]	91	79	1536
859	1	21	359	gi|385178	unknown [Bacillus subtilis]	91	66	339

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
1327	1	339	530	gi|496558	orfX [Bacillus subtilis]	91	71	192
2515	1	466	275	gi|511070	ureG [Staphylococcus xylosum]	91	85	192
3594	1	2	203	gi|146824	beta-cystathionase [Escherichia coli]	91	75	201
3764	1	847	425	gi|1021725	unknown [Staphylococcus haemolyticus]	91	78	423
4011	1	127	495	gi|1021726	unknown [Staphylococcus haemolyticus]	91	79	369
4227	1	1	177	gi|296464	ATPase [Lactococcus lactis]	91	66	177
42	3	815	1033	gi|520401	catalse [Haemophilus influenzae]	90	86	219
51	8	3717	4607	gi|580899	OppP gene product [Bacillus subtilis]	90	74	891
129	3	5317	4001	gi|1146206	glutamate dehydrogenase [Bacillus subtilis]	90	76	1317
164	17	16628	16913	epiP05766|RS15	305 RIBOSOMAL PROTEIN S15 (RS15)	90	74	306
171	5	2993	2819	gi|517475	D-amino acid transaminase [Staphylococcus haemolyticus]	90	78	165
205	4	4497	3550	gi|142463	RNA polymerase alpha-core-subunit [Bacillus subtilis]	90	76	948
205	6	4748	4410	gi|104989	ribosomal protein S13 [Bacillus subtilis]	90	73	339
205	10	7165	6404	gi|49189	IsacY gene product [Staphylococcus carnosus]	90	81	762
205	11	6645	6472	gi|49189	IsacY gene product [Staphylococcus carnosus]	90	78	174
205	27	13602	13345	gi|786157	ribosomal protein S19 [Bacillus subtilis]	90	79	348
205	31	15858	15496	gi|1165303	L3 [Bacillus subtilis]	90	79	363
260	5	7023	5773	gi|1161380	IcaA [Staphylococcus epidermidis]	90	78	1251
299	6	3378	3947	gi|467440	phosphoribosylpyrophosphate synthetase [Bacillus subtilis] gi|40218 PAPP synthetase (AA 1-317) [Bacillus subtilis]	90	78	570
320	2	1025	1717	gi|312443	carbamoyl-phosphate synthase (glutamine-hydrolysing) [Bacillus aldolyticus]	90	75	693
330	4	1581	1769	gi|986963	beta-tubulin [Sporidiobolus pararoseus]	90	80	189
369	1	954	523	pir|534762|S347	L-serine dehydratase beta chain - Clostridium sp.	90	77	432
557	1	3	188	gi|1511589	M. jannaschii predicted coding region M31624 [Methanococcus jannaschii]	90	54	186
663	2	667	1200	gi|143786	tryptophanyl-tRNA synthetase (EC 6.1.1.2) [Bacillus subtilis] pir|J070481|WDS tryptophan-tRNA ligase (EC 6.1.1.2) - Bacillus ubtilis	90	73	534
717	1	1	261	gi|143065	hubat [Bacillus stearothermophilus]	90	79	261
745	4	1059	865	gi|1205433	M. influenzae predicted coding region M1190 [Haemophilus influenzae]	90	81	195

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
1007	1	386	565	gi1143366	adenylosuccinate lyase (Pur-B) [Bacillus subtilis] pir[C29326]WZ85DS	90	77	180
1054	1	579	331	gi1033122	adenylosuccinate lyase (EC 4.3.2.3) - Bacillus subtilis	90	50	249
1156	1	117	707	gi1147776	ORF 4729 [Escherichia coli]	90	80	591
1180	1	408	205	gi1377831	ClpP [Bacillus subtilis]	90	74	204
1253	1	1	462	gi140046	unknown [Bacillus subtilis]	90	75	462
2951	1	3	269	gi144816	phosphoglucose isomerase A (AA 1-449) [Bacillus stearothermophilus] ir[S15936]NU85A glucose-6-phosphate isomerase (EC 5.3.1.9) A - cillus stearothermophilus	90	76	267
3140	1	327	166	gi1070014	formyltetrahydrofolate synthetase (PTHFS) (tcc start codon) (EC 3.4.3)	90	52	162
4594	1	3	233	gi1871784	protein-dependent [Bacillus subtilis]	90	76	231
87	1	1028	1750	gi1467327	Clp-like ATP-dependent protease binding subunit [Bos taurus]	89	75	723
112	1	2	505	gi153741	unknown [Bacillus subtilis]	89	77	504
118	1	120	398	gi1303804	ATP-binding protein [Streptococcus mutans]	89	75	279
128	4	3545	3757	gi1460257	YgeQ [Bacillus subtilis]	89	84	213
164	12	11667	12755	gi139954	triose phosphate isomerase [Bacillus subtilis]	89	80	1089
205	13	7875	7405	gi1216338	1P2 (aa 1-741) [Bacillus stearothermophilus]	89	76	471
205	32	16152	15823	gi1165303	ORF for L15 ribosomal protein [Bacillus subtilis]	89	80	330
270	3	2407	2207	pir[C41902]C419	L3 [Bacillus subtilis]	89	81	201
395	2	157	672	gi1520574	arsenate reductase (EC 1.-.-.-) - Staphylococcus xylosus plasmid PSX267	89	80	516
494	1	3	839	gi1396259	glutamate racemase [Staphylococcus haemolyticus]	89	77	837
510	1	1	448	gi140046	protease [Staphylococcus epidermidis]	89	74	448
615	1	2124	1210	gi1303812	phosphoglucose isomerase A (AA 1-449) [Bacillus stearothermophilus] ir[S15936]NU85A glucose-6-phosphate isomerase (EC 5.3.1.9) A - cillus stearothermophilus	89	74	915
841	1	18	341	gi1165303	YgeV [Bacillus subtilis]	89	80	324
1111	1	352	813	gi147146	L3 [Bacillus subtilis]	89	70	462
1875	1	2	256	gi1205108	thermonuclease [Staphylococcus intermedius]	89	82	255
2963	1	11	367	gi1467458	ATP-dependent protease binding subunit [Haemophilus influenzae]	89	83	357
					cell division protein [Bacillus subtilis]			

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
3020	1	90	362	gi|1239988	hypothetical protein [Bacillus subtilis]	89	66	273
3565	1	2	400	gi|1256635	dihydroxy-acid dehydratase [Bacillus subtilis]	89	75	359
3586	1	105	314	gi|580832	ATP synthase subunit gamma [Bacillus subtilis]	89	82	210
3629	1	794	399	gi|1009366	Respiratory nitrate reductase [Bacillus subtilis]	89	78	396
3688	1	2	400	gi|1146206	glutamate dehydrogenase [Bacillus subtilis]	89	75	399
3699	1	794	399	gi|1339950	large subunit of NADH-dependent glutamate synthase [Plectonema boryanum]	89	75	396
4016	1	428	216	gi|1009366	Respiratory nitrate reductase [Bacillus subtilis]	89	71	213
4177	1	471	301	gi|149426	putative [Lactococcus lactis]	89	76	171
4436	1	601	302	gi|1022725	unknown [Staphylococcus haemolyticus]	89	80	300
4635	1	320	162	gi|1022725	unknown [Staphylococcus haemolyticus]	89	73	159
2	2	1330	2676	gi|520754	putative [Bacillus subtilis]	88	76	1347
42	2	468	848	sp|P42321|CATA_	CATALASE [EC 1.11.1.6]	88	76	381
53	5	6389	4722	gi|474177	alpha-D-1,4-glucosidase [Staphylococcus xylosus]	88	80	1668
56	16	18018	18617	gi|467411	recombination protein [Bacillus subtilis]	88	77	600
60	3	376	843	gi|666116	glucose kinase [Staphylococcus xylosus]	88	77	468
70	2	1583	1245	gi|44095	replication initiator protein [Listeria monocytogenes]	88	74	339
82	8	11514	12719	pir|A60663|A606	translation elongation factor Tu - Bacillus subtilis	88	79	1206
103	7	4179	4391	gi|167181	serine/threonine kinase receptor [Brassica napus]	88	77	213
114	8	7732	8232	gi|1022726	unknown [Staphylococcus haemolyticus]	88	72	501
118	2	308	2011	gi|1303804	YqeQ [Bacillus subtilis]	88	77	1704
141	3	657	1136	gi|1405446	transketolase [Bacillus subtilis]	88	72	480
148	7	5871	6116	gi|1118002	dihydropteroate synthase [Staphylococcus haemolyticus]	88	78	246
165	3	1428	2231	gi|40053	phenylalanyl-tRNA synthetase alpha subunit [Bacillus subtilis] ir|S11730|VFSA phenylalanine-tRNA ligase [EC 6.1.1.20] alpha ein - Bacillus subtilis	88	80	804
205	28	15027	14185	gi|1165306	L2 [Bacillus subtilis]	88	82	843
225	1	1569	898	gi|1303840	Yqfs [Bacillus subtilis]	88	78	672
235	1	2	1975	gi|452309	valyl-tRNA synthetase [Bacillus subtilis]	88	76	1974

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
339	3	2060	1566	gi|1118002	[dihydropterate synthase (Staphylococcus haemolyticus)]	88	73	495
443	4	4325	2928	gi|558559	[pyrimidine nucleoside phosphorylase (Bacillus subtilis)]	88	73	1398
532	1	3	419	gi|143797	[valyl-tRNA synthetase (Bacillus stearothermophilus) sp|P1931|SVV_BACST VALYL-tRNA SYNTHETASE (EC 6.1.1.9) VALINE--TRNA LIGASE) (VALRS)]	88	78	417
534	3	2504	2968	gi|153049	[mannitol-specific enzyme-III (Staphylococcus carnosus) p|P190088|JQ0088 phosphotransferase system enzyme II (EC 7.1.1.69), mannitol-specific, factor III - Staphylococcus carnosus sp|P17876|PTMA_STACA PTS SYSTEM, MANNITOL-SPECIFIC IIA COMPONENT EIIA-MTU)]	88	82	465
705	2	584	399	gi|710018	[nitrite reductase (nirB) (Bacillus subtilis)]	88	70	185
1000	2	1824	1309	gi|1022726	[unknown (Staphylococcus haemolyticus)]	88	78	516
1299	1	587	324	gi|401786	[phosphomannomucase (Mycoplasma plium)]	88	55	264
1341	2	170	400	gi|39963	[ribosomal protein L20 (AA 1-119) (Bacillus stearothermophilus) ir|S05348|RS820 ribosomal protein L20 - Bacillus stearothermophilus]	88	82	231
1386	1	41	214	p|P1847134|B471	[signal recognition particle 56K chain homolog ffh - Bacillus subtilis]	88	71	174
1386	2	183	533	p|P1847134|B471	[signal recognition particle 36K chain homolog ffh - Bacillus subtilis]	88	73	351
2949	1	704	399	gi|535350	[CodX (Bacillus subtilis)]	88	73	306
2984	1	5	169	gi|218277	[O-acetylserine(thiol) lyase (Spinacia oleracea)]	88	70	165
3035	1	1	138	gi|493083	[dihydroxyacetone kinase (Citrobacter freundii)]	88	67	138
3089	1	3	152	gi|606055	[ORF_1746 (Escherichia coli)]	88	88	150
3917	1	817	410	gi|143378	[pyruvate decarboxylase (E-1) beta subunit (Bacillus subtilis)]	88	77	408
4199	1	680	342	gi|1405454	[aconitase (Bacillus subtilis)]	88	82	339
4201	1	734	369	gi|515938	[glutamate synthase (ferredoxin) (Synecocystis sp.) p|P1846957|S46957 glutamate synthase (ferredoxin) (EC 1.4.7.1) - ynechocystis sp.]	88	84	366
4274	1	1	336	gi|515938	[glutamate synthase (ferredoxin) (Synecocystis sp.) p|P1846957|S46957 glutamate synthase (ferredoxin) (EC 1.4.7.1) - ynechocystis sp.]	88	84	336
4308	1	794	399	gi|1146206	[glutamate dehydrogenase (Bacillus subtilis)]	88	71	396
2	5	4570	6000	gi|535350	[CodX (Bacillus subtilis)]	87	70	1431
52	8	6781	6482	gi|1064791	[function unknown (Bacillus subtilis)]	87	66	300

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
73	3	1584	2480	gi1142992	glycerol kinase (gpk) (EC 2.7.1.30) [Bacillus subtilis] pir1845868|B45868 glycerol kinase (EC 2.7.1.30) - Bacillus subtilis sp18157|CLPK_BACSU (GLYCEROL KINASE) (CK)	87	72	897
98	12	8813	9100	gi1467433	unknown [Bacillus subtilis]	87	62	288
124	4	4265	2988	gi1556886	serine hydroxymethyltransferase [Bacillus subtilis] pir1845868|B45868 serine hydroxymethyltransferase - Bacillus ubtilis	87	77	1270
124	6	4457	4032	gi1556883	Unknown [Bacillus subtilis]	87	66	426
148	5	3741	4559	gi1467460	unknown [Bacillus subtilis]	87	70	819
164	13	12710	13810	gi139954	IF2 (aa 1-741) [Bacillus stearothermophilus]	87	72	1101
177	2	1104	2126	gi1467385	unknown [Bacillus subtilis]	87	78	1023
199	1	1982	1158	gi143527	iron-sulfur protein [Bacillus subtilis]	87	77	825
199	2	4717	2933	pir1845868|B45868	flavoprotein - Bacillus subtilis	87	80	1785
205	23	11782	11543	gi1104972	ribosomal protein L29 [Bacillus subtilis]	87	76	240
205	25	11375	12807	gi1165309	IS3 [Bacillus subtilis]	87	75	669
222	1	2033	1107	gi1117249	rec233 gene product [Bacillus subtilis]	87	70	927
236	3	1635	1333	gi1146198	ferredoxin [Bacillus subtilis]	87	80	303
246	5	2585	2292	gi1467373	ribosomal protein S18 [Bacillus subtilis]	87	77	294
260	2	4189	3422	gi1161382	liceC [Staphylococcus epidermidis]	87	72	768
320	3	1696	2391	gi1312443	carbamoyl-phosphate synthase (glutamine-hydrolyzing) [Bacillus aldolyticus]	87	80	696
380	4	1165	1363	gi1142570	ATP synthase c subunit [Bacillus firmus]	87	80	219
414	4	900	1073	gi1467386	chlorophen and furan oxidation [Bacillus subtilis]	87	77	174
435	2	1003	794	gi11046166	pilin repressor [Mycoplasma genitalium]	87	69	210
448	1	1255	722	gi1405134	acetate kinase [Bacillus subtilis]	87	75	534
480	1	1	711	gi1142559	ATP synthase alpha subunit [Bacillus megaterium]	87	79	711
481	1	2	352	sp140679|RL1_B	50S RIBOSOMAL PROTEIN L1 (BL1)	87	72	351
677	2	359	955	gi1460911	fructose-bisphosphate aldolase [Bacillus subtilis]	87	78	597
677	3	934	1284	gi1460911	fructose-bisphosphate aldolase [Bacillus subtilis]	87	78	351
876	1	3	452	gi1146247	asparaginyl-tRNA synthetase [Bacillus subtilis]	87	79	450

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Cunlig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
1376	1	426	214	gi|1065555	P46H6.4 gene product [Caenorhabditis elegans]	87	75	213
2206	1	3	374	gi|215098	excisionase [Bacteriophage 156a]	87	72	372
2938	1	3	290	gi|508979	GTP-binding protein [Bacillus subtilis]	87	69	288
3081	2	126	308	gi|467199	IMP dehydrogenase [Bacillus subtilis]	87	72	183
3535	1	3	401	gi|1405454	aconitase [Bacillus subtilis]	87	90	399
4238	1	547	275	gi|603769	HutU protein, uronase [Bacillus subtilis]	87	73	273
4	8	10427	8736	gi|603769	HutU protein, uronase [Bacillus subtilis]	86	72	1692
22	6	4190	3738	gi|410515	urease beta subunit [Staphylococcus xylosum]	86	73	453
54	2	2480	1572	gi|289287	UDP-glucose pyrophosphorylase [Bacillus subtilis]	86	70	909
124	3	2336	1713	gi|556887	uracil phosphoribosyltransferase [Bacillus subtilis] uracil phosphoribosyltransferase - Bacillus subtilis	86	74	624
148	3	1349	3448	gi|467458	cell division protein [Bacillus subtilis]	86	75	2100
148	4	3638	3859	gi|467460	unknown [Bacillus subtilis]	86	73	222
152	3	1340	2086	gi|1377835	pyruvate decarboxylase E-1 alpha subunit [Bacillus subtilis]	86	75	747
164	18	17347	19467	gi|1184680	polynucleotide phosphorylase [Bacillus subtilis]	86	72	2121
180	2	554	1159	gi|143467	ribosomal protein S4 [Bacillus subtilis]	86	80	606
205	3	2966	2592	gi|142464	ribosomal protein L17 [Bacillus subtilis]	86	77	375
205	26	13364	12990	gi|40107	ribosomal protein L22 [Bacillus stearothermophilus] ribosomal protein L22 - Bacillus stearothermophilus	86	75	375
246	7	3463	3140	gi|467375	ribosomal protein S6 [Bacillus subtilis]	86	70	324
299	3	1196	1340	gi|39656	lapVG gene product [Bacillus megaterium]	86	70	345
299	7	3884	4345	gi|467440	phosphoribosylpyrophosphate synthetase [Bacillus subtilis] synthetase (AA 1-317) [Bacillus subtilis]	86	78	462
304	5	2170	2523	gi|666983	putative ATP binding subunit [Bacillus subtilis]	86	65	354
310	2	1487	1678	gi|1177684	chorismate mutase [Staphylococcus xylosum]	86	71	192
337	5	2086	3405	gi|487434	isocitrate dehydrogenase [Bacillus subtilis]	86	78	1320
339	2	1489	1109	gi|1118003	dihydropyrimidin aldolase [Staphylococcus haemolyticus]	86	77	381
358	2	2124	3440	gi|1146219	28.2% of identity to the Escherichia coli GTP-binding protein Era; putative [Bacillus subtilis]	86	73	1317

TABLE 2

5. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% idenc	length (nt)
404	2	1015	2058	gi|1303817	YqfA (Bacillus subtilis)	86	78	1044
581	2	661	452	gi|40056	phop gene product (Bacillus subtilis)	86	71	210
642	2	338	1075	gi|1176399	Epif (Staphylococcus epidermidis)	86	72	738
770	1	622	347	gi|143328	phop protein (put.) putative (Bacillus subtilis)	86	69	276
865	1	1777	890	gi|1146247	asparaginyl-tRNA synthetase (Bacillus subtilis)	86	74	888
868	2	963	1133	gi|1002911	transmembrane protein (Saccharomyces cerevisiae)	86	69	171
904	1	1	162	gi|1303912	YqfW (Bacillus subtilis)	86	72	162
989	1	35	433	gi|1303993	YqfL (Bacillus subtilis)	86	76	399
1212	1	256	150	gi|414014	ipa-90d gene product (Bacillus subtilis)	86	70	147
1323	1	2	148	gi|40041	pyruvate dehydrogenase (liponamide) (Bacillus stearothermophilus) - Bacillus stearothermophilus	86	75	147
3085	2	540	310	gi|1354211	pgt12-like protein (Bacillus subtilis)	86	86	231
1847	1	1	228	gi|296464	ATPase (Lactococcus lactis)	86	63	228
4487	1	476	240	gi|1022726	unknown (Staphylococcus haemolyticus)	86	73	237
4583	1	372	187	gi|1022725	unknown (Staphylococcus haemolyticus)	86	79	186
25	5	4287	5039	gi|1502421	3-ketoacyl-acyl carrier protein reductase (Bacillus subtilis)	85	64	753
56	21	30627	29395	gi|1408507	pyrimidine nucleoside transport protein (Bacillus subtilis)	85	69	1233
68	2	332	1192	gi|467376	unknown (Bacillus subtilis)	85	74	861
73	2	860	1707	gi|142992	glycerol kinase (gloK) (EC 2.7.1.30) (Bacillus subtilis) pif[B45868/B45868 glycerol kinase (EC 2.7.1.30) - Bacillus subtilis ap[p18157/CLPK_BACSU GLYCEROL KINASE (EC 2.7.1.30) (ATP:GLYCEROL -PHOSPHOTRANSFERASE) (GLYCEROKINASE) (CK).	85	72	828
106	4	1505	3490	gi|143766	(thrSv) (EC 6.1.1.3) (Bacillus subtilis)	85	74	1986
128	2	1153	2202	gi|311924	glyceraldhyde-3-phosphate dehydrogenase (Clostridium pasteurianum) pif[S34254/S34254 glyceraldehyde-3-phosphate dehydrogenase (EC 2.1.1.12) - Clostridium pasteurianum	85	75	1050
129	4	6466	52527	gi|1064807	ORTHOMINE AMINOTRANSFERASE (Bacillus subtilis)	85	73	1215
138	6	3475	5673	gi|1072419	glcB gene product (Staphylococcus carnosus)	85	74	2199
189	1	2	169	gi|467385	unknown (Bacillus subtilis)	85	65	168

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	patch gene name	% sim	% ident	length (nt)
205	15	8624	8106	gi|1044981	ribosomal protein S5 [Bacillus subtilis]	85	75	519
205	20	10928	10596	gi|102819|RSBS	ribosomal protein L24 - Bacillus stearothermophilus	85	72	333
220	6	6490	6101	gi|48980	secA gene product [Bacillus subtilis]	85	66	390
231	4	4877	3159	gi|1002520	MutS [Bacillus subtilis]	85	70	1719
243	9	8013	8783	gi|414011	lipA-87r gene product [Bacillus subtilis]	85	72	771
249	2	5894	3186	gi|1405454	aconitase [Bacillus subtilis]	85	73	2709
302	1	140	475	gi|40173	homolog of E.coli ribosomal protein L21 [Bacillus subtilis] ir|S18439|S18439 Ribosomal protein L21 - Bacillus subtilis p|P26908|RL21_BACSU 50S RIBOSOMAL PROTEIN L21 (BL20).	85	72	336
333	1	5445	2968	gi|442360	ClpC adenosine triphosphatase [Bacillus subtilis]	85	69	2478
364	6	6082	8196	gi|871784	Clp-like ATP-dependent protease binding subunit [Bos taurus]	85	68	2115
448	2	1992	1339	gi|405334	acetate kinase [Bacillus subtilis]	85	68	654
747	1	1251	853	gi|1373157	orf-X, hypothetical protein; Method: conceptual translation supplied by author [Bacillus subtilis]	85	73	399
886	2	159	467	gi|541768	hemin permease [Yersinia enterocolitica]	85	55	309
1049	1	1208	606	gi|847154|B471	signal recognition particle 54K chain homolog Ffh - Bacillus subtilis	85	71	603
1163	1	816	409	gi|304155	diaminopimelate decarboxylase [Bacillus methanolicus] sp|P41023|DCDA_BACWT DIAMINOPIMELATE DECARBOXYLASE (EC 4.1.1.20) DAP DECARBOXYLASE.	85	61	408
1974	1	487	251	gi|215098	excisionase [Bacteriophage 154a]	85	73	237
2932	1	776	390	gi|1041099	pyruvate kinase [Bacillus licheniformis]	85	71	387
3030	1	3	275	gi|42370	pyruvate formate-lyase (AA 1-760) [Escherichia coli] ir|S01788|S01788 formate C-acetyltransferase (EC 2.3.1.54) - chetichia coli	85	74	273
3111	1	595	299	gi|63568	limb deformity protein [Gallus gallus]	85	85	297
3778	1	630	316	gi|391840	beta-subunit of HCR [Pseudomonas fragi]	85	67	315
3835	1	1	387	gi|1204472	type I restriction enzyme ECD124/3 I M protein [Haemophilus influenzae]	85	56	387
4042	1	3	386	gi|18178	formate acetyltransferase [Chlamydomonas reinhardtii] ir|S24997|S24997 formate C-acetyltransferase (EC 2.3.1.54) - lamydomonas reinhardtii	85	70	384
4053	1	35	340	gi|1204472	type I restriction enzyme ECD124/3 I M protein [Haemophilus influenzae]	85	56	306
4108	1	2	181	gi|1072418	olcA gene product [Staphylococcus carnosus]	85	61	180
4300	1	575	330	gi|1151932	fructose enzyme II [Rhodobacter capsulatus]	85	59	246

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
4392	1	627	355	gi11022725	unknown [Staphylococcus haemolyticus]	85	74	273
4408	1	2	235	gi1671784	Cip-like ATP-dependent protease binding subunit (Bos taurus)	85	62	234
4430	1	578	291	gi11009366	Respiratory nitrate reductase [Bacillus subtilis]	85	68	288
4555	1	2	253	gi1450688	hscM gene of EcoRrr gene product [Escherichia coli] pIR[S38437/S38437 hscM protein - Escherichia coli pIR[S09629/S09629 hypothetical protein A - Escherichia coli (SUB 40-520)]	85	52	252
4611	1	481	242	gi1256635	dihydroxy-acid dehydratase [Bacillus subtilis]	85	65	240
4	10	10061	10591	gi146982	fosB gene product [Staphylococcus epidermidis]	84	68	531
13	2	1348	1172	gi1142450	fehC protein [Bacillus subtilis]	84	56	177
16	4	1803	4652	gi11271198	DNA repair protein [Deinococcus radiodurans]	84	67	2850
22	3	1535	1128	gi1511069	Iuref [Staphylococcus xylosum]	84	73	408
23	7	5055	5306	gi1603320	Yer082p [Saccharomyces cerevisiae]	84	61	252
53	11	11597	11145	gi11303948	YqjW [Bacillus subtilis]	84	68	453
53	12	14059	12770	gi1142613	branched chain alpha-keto acid dehydrogenase E2 [Bacillus subtilis]	84	71	1200
70	1	1332	982	gi146647	ORF (repE) [Staphylococcus aureus]	84	68	351
73	4	2512	4311	gi1142993	Glyceral-3-phosphate dehydrogenase (gipD) [EC 1.1.99.5] [Bacillus subtilis]	84	74	1800
98	7	4324	6096	gi1467427	methionyl-tRNA synthetase [Bacillus subtilis]	84	66	1773
100	9	9501	8680	gi11340128	ORF1 [Staphylococcus aureus]	84	78	822
117	3	1934	3208	gi11237019	Srb [Bacillus subtilis]	84	68	1275
148	6	4720	5670	gi1467462	cysteine synthetase A [Bacillus subtilis]	84	69	951
152	4	2064	2456	gi1143377	pyruvate decarboxylase (E-1) alpha subunit [Bacillus subtilis]	84	70	393
169	7	3634	3861	gi11001342	hypothetical protein [Synecocystis sp.]	84	66	228
171	4	2992	2657	gi1517475	D-amino acid transaminase [Staphylococcus haemolyticus]	84	71	336
186	6	6941	6216	gi1467475	unknown [Bacillus subtilis]	84	70	726
205	9	6261	5692	gi1216340	ORF for adenylate kinase [Bacillus subtilis]	84	71	570
224	2	915	1391	gi1288269	beta-fructofuranosidase [Staphylococcus xylosum]	84	70	477

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	Length (nt)
251	1	92	388	gi|1303790	yqeI [Bacillus subtilis]	84	65	297
282	3	1526	2836	gi|143040	glutamate-L-semialdehyde 2,1-aminotransferase [Bacillus subtilis] pir|042728|042728 glutamate-L-semialdehyde 2,1-aminomutase (EC 4.3.8) - Bacillus subtilis	84	75	1311
307	5	3138	2959	gi|1070014	protein-dependent [Bacillus subtilis]	84	62	180
320	4	2343	4229	gi|143390	[carbamyl phosphate synthetase [Bacillus subtilis]	84	70	1887
372	1	3	296	gi|1022725	unknown [Staphylococcus haemolyticus]	84	70	294
413	2	2201	1341	gi|1256146	ybbQ [Bacillus subtilis]	84	65	861
439	1	3	392	gi|1046173	osmotically inducible protein [Mycoplasma genitalium]	84	53	390
461	3	1362	2270	gi|40211	threonine synthase (thrC) (AA 1-352) [Bacillus subtilis] ir|A25364|A25364 threonine synthase (EC 4.2.99.2) - Bacillus brille	84	69	909
487	1	3	299	gi|1144531	integrin-like protein alpha Intip [Candida albicans]	84	46	297
491	2	624	905	pir|S08564|R385	ribosomal protein S9 - Bacillus stearothermophilus	84	69	282
491	3	816	1033	pir|S08564|R385	ribosomal protein S9 - Bacillus stearothermophilus	84	77	198
548	1	3	341	gi|411231	huacil peptidase [Bacillus caldolyticus]	84	74	339
728	2	2701	1748	gi|1912445	DNA polymerase [Bacillus caldotenax]	84	68	954
769	1	3	257	gi|11510953	cobalamin biosynthesis protein N [Methanococcus jannaschii]	84	38	255
954	1	308	156	gi|11405454	aconitase [Bacillus subtilis]	84	57	151
957	1	3	395	gi|1143402	recombination protein (ttg start codon) [Bacillus subtilis] gi|1303923 RecN [Bacillus subtilis]	84	68	393
975	1	3	452	gi|885934	ClpB [Synecococcus sp.]	84	70	450
1585	1	3	257	gi|1510140	lipoendopeptidase F [Lactococcus lactis]	84	56	255
2954	1	3	323	gi|603769	HutU protein, urocanase [Bacillus subtilis]	84	73	321
2996	1	650	348	gi|18178	formate acetyltransferase [Chlamydomonas reinhardtii] ir|S24997|S24997 formate C-acetyltransferase (EC 2.3.1.54) - Chlamydomonas reinhardtii	84	65	303
3766	1	737	375	gi|1517205	67 kDa Myosin-crossreactive streptococcal antigen [Streptococcus pyogenes]	84	72	363
4032	1	2	169	gi|1146206	glutamate dehydrogenase [Bacillus subtilis]	84	54	168
4058	1	620	312	gi|151932	fructose enzyme II [Rhodospirillum rubrum]	84	71	309
4108	2	106	351	gi|1072418	glcA gene product [Staphylococcus carnosus]	84	77	246

TABLE 2

S aureus - putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
4183	1	3	308	gi1603769	thtU protein, ureocanase (Bacillus subtilis)	84	72	306
4726	1	55	234	gi146208	glutamate synthase large subunit (EC 2.6.1.53) (Escherichia coli) pifA29617A29617 glutamate synthase (NADPH) (EC 1.4.1.13) large chain - Escherichia coli	84	73	180
22	4	2043	1576	gi1393297	urease accessory protein (Bacillus sp.)	83	64	468
53	13	14722	13745	gi142612	branched chain alpha-keto acid dehydrogenase E1-beta (Bacillus subtilis)	83	68	978
57	16	13357	12872	gi143132	lactate dehydrogenase (EC 1.1.1.27) (Bacillus caldolyticus) pifB29704B29704 L-lactate dehydrogenase (EC 1.1.1.27) - Bacillus caldolyticus	83	66	486
66	3	3119	2274	gi1303894	YqhM (Bacillus subtilis)	83	63	846
66	5	6118	4643	gi1212730	YqhK (Bacillus subtilis)	83	68	1476
70	3	1864	1523	gi144095	replication initiator protein (Listeria monocytogenes)	83	73	142
90	1	377	1429	gi155571	alcohol dehydrogenase I (adhA) (EC 1.1.1.1) (Zymomonas mobilis) pifA35460A35460 alcohol dehydrogenase (EC 1.1.1.1) - Zymomonas mobilis	83	70	1053
95	2	708	2162	gi1506381	phospho-beta-glucosidase (Bacillus subtilis)	83	70	1455
137	1	68	694	gi1467391	initiation protein of replication (Bacillus subtilis)	83	77	627
140	4	3209	2742	gi1634107	kdpB (Escherichia coli)	83	65	468
142	3	3468	2989	gi1212776	l-glutamine synthase (b-subunit) (Bacillus amyloqueliculus)	83	69	480
161	12	5749	6696	gi1903307	ORF75 (Bacillus subtilis)	83	64	948
164	9	9880	11070	gi149316	ORF2 gene product (Bacillus subtilis)	83	66	1191
164	14	14148	14546	gi1580902	ORF6 gene product (Bacillus subtilis)	83	60	399
170	2	3144	2467	gi1530844	orf4 (Bacillus subtilis)	83	64	678
186	2	2029	1370	gi1289284	cysteine tRNA synthetase (Bacillus subtilis)	83	72	660
205	14	7822	7607	gi1216337	ORF for L30 ribosomal protein (Bacillus subtilis)	83	74	216
237	6	3683	4540	gi1510488	imidazoleglycerol-phosphate synthase (cyclase) (Methanococcus jannaschii)	83	60	858
301	1	895	636	gi1467419	unknown (Bacillus subtilis)	83	65	348
302	4	1421	2743	gi1508979	GTP-binding protein (Bacillus subtilis)	83	68	1323
321	4	3933	3571	gi139844	l-fumarate (citG) (aa 1-462) (Bacillus subtilis)	83	68	363
367	1	2	352	gi11039479	ORFU (Lactococcus lactis)	83	54	351

TABLE 2

S. aureus - putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	patch gene name	% sim	% ident	length (nt)
387	1	3	662	[gi|806281	DNA polymerase I (Bacillus stearothermophilus)	83	70	660
527	2	916	1566	[gi|396259	protease (Staphylococcus epidermidis)	83	67	651
533	1	355	179	[gi|142455	alanine dehydrogenase (EC 1.4.1.1) (Bacillus stearothermophilus)	83	66	177
				[pir|B34261|B34261	alanine dehydrogenase (EC 1.4.1.1) - Bacillus stearothermophilus			
536	4	1617	1438	[gi|143366	adenylosuccinate lyase (Pur-B) (Bacillus subtilis); [ir|C29326|W28SDS	83	67	180
					adenylosuccinate lyase (EC 4.3.2.2) - Bacillus subtilis			
652	1	2	859	[gi|520753	DNA topoisomerase I (Bacillus subtilis)	83	72	858
774	2	200	361	[gi|1522665	M. jannaschii predicted coding region KJECU28 (Methanococcus jannaschii)	83	58	162
897	1	120	296	[gi|1064807	ORTHURINE AMINOTRANSFERASE (Bacillus subtilis)	83	76	177
1213	1	3	491	[gi|289288	lexA (Bacillus subtilis)	83	67	489
2529	1	296	150	[gi|143786	trypophanyl-tRNA synthetase (EC 6.1.1.2) (Bacillus subtilis)	83	69	147
				[pir|J70481|J70481	tryptophan-tRNA ligase (EC 6.1.1.2) - Bacillus subtilis			
2973	1	649	326	[gi|1109687	ProZ (Bacillus subtilis)	83	58	324
1009	1	728	366	[gi|182432	ORF_0294 (Escherichia coli)	83	65	363
3035	2	45	305	[gi|950062	hypothetical yeast protein 1 (Mycoplasma capricolum) [pir|S48578|S48578	83	59	261
					hypothetical protein - Mycoplasma capricolum SGC3 (fragment)			
3906	1	67	309	[gi|1353197	thioredoxin reductase (Eubacterium acidaminophilum)	83	61	243
4458	1	540	271	[gi|397526	clumping factor (Staphylococcus aureus)	83	78	270
4570	1	444	223	[gi|1022726	unknown (Staphylococcus haemolyticus)	83	74	222
4654	1	97	261	[gi|1072419	glcB gene product (Staphylococcus carnosus)	83	75	165
16	2	295	1191	[gi|153854	lws402 protein (Streptococcus pneumoniae)	82	67	897
16	3	1193	1798	[gi|153854	lws402 protein (Streptococcus pneumoniae)	82	70	606
38	12	9644	8724	[gi|1204400	N-acetylneuraminate lyase (Haemophilus influenzae)	82	58	921
42	4	988	2019	[gi|841192	catalse (Bacteroides fragilis)	82	70	1032
51	6	2590	3489	[gi|143607	sporulation protein (Bacillus subtilis)	82	69	900
56	11	12270	13925	[gi|39431	oligo-1,6-glucosidase (Bacillus cereus)	82	60	1656
56	15	17673	18014	[gi|467410	unknown (Bacillus subtilis)	82	66	342
61	2	881	3313	[gi|143148	transfer RNA-Leu synthetase (Bacillus subtilis)	82	70	2433

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
82	7	9162	11318	gi|48240	elongation factor G (AA 1-491) [Thermus aquaticus thermophilus] tr|S15928|EFTMG elongation factor G - Thermus aquaticus p|P13551|EFG, THERM ELONGATION FACTOR G (EF-G).	82	64	2157
85	2	5470	3260	gi|143369	phosphoribosylformyl glycylamide synthetase II (PUR-Q) [Bacillus subtilis]	82	66	2311
102	6	3662	5380	gi|1256635	dihydroxy-acid dehydratase [Bacillus subtilis]	82	65	1719
117	4	3242	3493	pir|A47154|A471	orf1 5' of Fth - Bacillus subtilis	82	53	252
128	6	4377	5933	gi|460258	phosphoglycerate kinase [Bacillus subtilis]	82	66	1557
129	2	1229	2182	gi|403373	glycerophosphoryl diester phosphodiesterase [Bacillus subtilis] pir|S37251|S37251 glycerophosphoryl diester phosphodiesterase - acillus subtilis	82	62	954
170	1	2	1441	gi|1377831	unknown [Bacillus subtilis]	82	67	1440
177	1	3	1094	gi|467386	thiophen and furan oxidation [Bacillus subtilis]	82	65	1092
184	4	3572	4039	gi|153566	ORF (19K protein) [Enterococcus faecalis]	82	59	468
189	8	4455	4225	gi|1001878	CapL protein [Listeria monocytogenes]	82	71	231
206	19	21366	20707	gi|473916	lipopeptide antibiotics iturin A [Bacillus subtilis] ap|P39144|UPI4_BACSU LIPPEPTIDE ANTIBIOTICS ITURIN A AND SURFACTIN BIOSYNTHESIS PROTEIN.	82	50	660
221	2	805	1722	gi|517205	67 kDa Myosin-crossreactive streptococcal antigen [Streptococcus pyogenes]	82	63	918
223	4	3866	3651	gi|439619	[Salmonella typhimurium IS200 insertion sequence from SARA17, artial.], gene product [Salmonella typhimurium]	82	69	216
260	3	5207	4296	gi|1161381	IcAB [Staphylococcus epidermidis]	82	61	912
315	3	4864	2855	gi|143397	quinol oxidase [Bacillus subtilis]	82	67	2010
321	10	8520	7945	gi|142981	ORF5: This ORF includes a region (aa23-103) containing a potential non- sulphur centre homologous to a region of Rhodospirillum rubrum nd Chromatium vinosum; putative [Bacillus stearothermophilus] pir|PQ0399|PQ0399 hypothetical protein 5 (glxk 3' region) -	82	62	576
331	3	1055	1342	gi|436574	ribosomal protein L1 [Bacillus subtilis]	82	71	288
370	2	262	618	gi|1301793	YqeL [Bacillus subtilis]	82	59	357
404	4	3053	4024	gi|1303821	YqfE [Bacillus subtilis]	82	68	972
405	4	4440	3075	gi|1303913	YqhX [Bacillus subtilis]	82	67	1368
436	3	4096	2864	gi|149521	tryptophan synthase beta subunit [Lactococcus lactis] pir|S3129|S3129 tryptophan synthase (EC 4.2.1.20) beta chain - actococcus lactis subsp. lactis	82	67	1233

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
441	4	3394	2573	gi|142952	glyceraldhyde-3-phosphate dehydrogenase [Bacillus thermoautotrophicus]	82	67	822
444	12	10415	11227	gi|1204354	spore germination and vegetative growth protein [Haemophilus influenzae]	82	67	813
446	1	3	191	gi|143387	aspartate transcarbamylase [Bacillus subtilis]	82	66	189
462	3	1007	1210	gi|142521	deoxyribodipyrimidine photolyase [Bacillus subtilis] p137192 uvrB protein - Bacillus subtilis sp|P14951|UVRB_BACSU EXCINUCLEASE ABC SUBUNIT C.	82	64	204
537	1	1560	784	gi|453767	UDP-N-acetylglucosamine 1-carboxyvinyltransferase [Bacillus subtilis]	82	61	777
680	2	407	700	gi|426472	acet gene product [Staphylococcus carnosus]	82	69	294
724	2	565	386	gi|143373	phosphoribosyl aminimidazole carboxy formyl oranylttransferase/inosine monophosphate cyclohydrolase (pur-H37) [Bacillus subtilis]	82	68	180
763	1	422	213	gi|1467458	cell division protein [Bacillus subtilis]	82	35	210
818	1	564	281	gi|1064787	function unknown [Bacillus subtilis]	82	69	282
858	1	175	1176	gi|143043	uroporphyrinogen decarboxylase [Bacillus subtilis] p1374045 uroporphyrinogen decarboxylase (EC 4.1.1.37) - acillus subtilis	82	71	1002
895	1	3	599	gi|1027507	ATP binding protein [Borrelia burgdorferi]	82	72	597
939	1	10	399	gi|143795	transfer RNA-Tyr synthetase [Bacillus subtilis]	82	60	390
961	1	3	306	gi|577647	gamma-hemolysin [Staphylococcus aureus]	82	69	306
1192	1	307	155	gi|146974	NH2-dependent NAD synthetase [Escherichia coli]	82	71	153
1317	1	49	375	gi|1407908	Elisac [Staphylococcus xylosus]	82	72	327
1341	1	1	150	gi|139962	ribosomal protein L35 (AA 1-66) [Bacillus stearothermophilus]	82	68	150
2990	2	567	349	gi|534855	ATPase subunit epsilon [Bacillus stearothermophilus] sp|P42009|ATPE_BACST ATP SYNTHASE EPSILON CHAIN (EC 3.6.1.34).	82	47	219
3024	1	45	224	gi|1467402	unknown [Bacillus subtilis]	82	64	180
3045	1	276	139	gi|1467335	ribosomal protein L9 [Bacillus subtilis]	82	60	138
3045	2	558	400	gi|1467335	ribosomal protein L9 [Bacillus subtilis]	82	82	159
3091	1	474	238	gi|1499335	secA protein [Staphylococcus carnosus]	82	78	237
3107	1	416	210	gi|1469918	orfY 3' of comK [Bacillus subtilis, E26, Peptide Partial, 140 aa] p1374045|S30612 hypothetical protein Y - Bacillus subtilis sp|P40398|YHND_BACSU HYPOTHETICAL PROTEIN IN COME 3'-REGION (ORFY FRAGMENT).	82	64	207

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
4332	1	2	319	gi|42086	nitrate reductase alpha subunit [Escherichia coli] p[09152]NARO_ECOLI RESPIRATORY NITRATE REDUCTASE 1 ALPHA CHAIN (EC 7.99.4). (SUB 2-1247)	82	75	318
23	3	3275	2574	gi|1199573	apsB [Shigomonas sp.]	81	64	702
42	1	638	321	gi|466778	lysine specific peptidase [Escherichia coli]	81	59	318
48	5	4051	4350	gi|1045937	M. genitalium predicted coding region NG216 [Mycoplasma genitalium]	81	62	300
51	4	1578	2579	gi|516649|S166	dcfAC protein - Bacillus subtilis	81	55	1002
53	2	354	1494	gi|1301961	YqjJ [Bacillus subtilis]	81	67	1131
53	8	9419	7971	gi|146930	6-phosphogluconate dehydrogenase [Escherichia coli]	81	66	1449
54	9	10757	10119	gi|143016	permease [Bacillus subtilis]	81	65	639
54	10	11360	11786	gi|143015	glucanase kinase [Bacillus subtilis]	81	64	1575
57	17	13983	13366	gi|425805|A258	L-lactate dehydrogenase (EC 1.1.1.27) - Bacillus subtilis	81	74	618
81	2	2708	2217	gi|1122302	NitO-related protein [Haemophilus influenzae]	81	54	492
86	1	745	374	gi|414017	jpa-93d gene product [Bacillus subtilis]	81	70	372
103	6	6438	4861	gi|5971342	nitrate reductase beta subunit [Bacillus subtilis] sp|P42176|NANH_BACSU NITRATE REDUCTASE BETA CHAIN (EC 1.7.99.4).	81	64	1578
120	15	10845	12338	gi|1524392	CbsA [Bacillus subtilis]	81	67	1494
128	5	3676	4413	gi|143319	fructose phosphate isomerase [Bacillus megaterium]	81	64	718
131	9	10308	9280	gi|299163	alanine dehydrogenase [Bacillus subtilis]	81	68	1039
143	6	6088	5471	gi|439619	[Salmonella typhimurium] IS200 insertion sequence (from SARA17, att1a1.1, gene product [Salmonella typhimurium])	81	61	618
169	1	43	825	gi|697795	30S ribosomal protein [pediococcus acidilactici] sp|P49668|PS2_PEDAC 30S RIBOSOMAL PROTEIN S2	81	65	783
230	1	450	226	gi|1125826	short region of weak similarity to tyrosine-protein kinase receptors in a fibronectin type III-like domain [Caenorhabditis elegans]	81	54	225
233	5	2000	2677	gi|467406	unknown [Bacillus subtilis]	81	63	678
241	2	3081	2149	gi|16310	succinate-CoA ligase (GDP-forming) [Arabidopsis thaliana] ir|S30579|S30579 succinate-CoA ligase (GDP-forming) (EC 6.2.1.4) pha chain - Arabidopsis thaliana (fragment)	81	69	933
256	1	1	981	nit|S09411|S094	spo11E protein - Bacillus subtilis	81	65	981
259	3	3752	2691	sp|P28367|PF2_B	PROBABLE PEPTIDE CHAIN RELEASE FACTOR 2 (RP-2) (FRAGMENT)	81	65	1062

TABLE 2

3. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	Length (nt)
275	2	1728	3581	gi|726480	L-glutamine-D-fructose-6-phosphate amidotransferase [Bacillus subtilis]	81	68	1854
285	1	1466	735	gi|1204844	H. influenzae predicted coding region H0594 [Haemophilus influenzae]	81	63	732
296	1	99	1406	gi|467328	adenylosuccinate synthetase [Bacillus subtilis]	81	67	1308
302	9	5590	5689	gi|147485	queA [Escherichia coli]	81	64	300
317	2	1137	1376	gi|154961	resolvase [Transposon Tn917]	81	53	240
343	2	1034	1342	gi|405955	lyeD [Escherichia coli]	81	60	309
360	2	1404	2471	gi|1204570	aspartyl-tRNA synthetase [Haemophilus influenzae]	81	67	1086
364	5	6251	5706	gi|1204652	methylated-DNA-protein-cysteine methyltransferase [Haemophilus influenzae]	81	63	546
372	2	1707	1135	gi|467416	unknown [Bacillus subtilis]	81	65	573
392	1	43	603	gi|509411|S094	sporIII protein - Bacillus subtilis	81	65	561
404	9	5252	6154	gi|1606745	bex [Bacillus subtilis]	81	65	903
426	2	1727	1119	gi|39453	Manganese superoxide dismutase [Bacillus caldotenax] tr[S22053]S22053 superoxide dismutase (EC 1.15.1.1) (Mn) - Bacillus licheniformis	81	66	609
480	7	5653	5889	gi|137083|C370	hypothetical protein II (ompII 3' region) - Salmonella typhimurium (fragment)	81	57	237
625	3	1105	2070	gi|1262360	protein kinase PknB [Mycobacterium leprae]	81	56	966
734	2	504	1064	gi|1303902	yqhu [Bacillus subtilis]	81	71	561
842	1	86	430	gi|1405446	transketolase [Bacillus subtilis]	81	68	345
953	1	798	400	gi|1205429	dipeptide transport ATP-binding protein [Haemophilus influenzae]	81	57	399
961	2	252	401	gi|487686	synergohymenotropic toxin [Staphylococcus intermedius] ptx[S44944]S44944 synergohymenotropic toxin - Staphylococcus intermedius	81	72	150
1035	1	1	189	gi|1046138	M. genitalium predicted coding region MG423 [Mycoplasma genitalium]	81	43	189
1280	1	670	449	gi|559164	helicase [Autographa californica nuclear polyhedrosis virus] sp[P24307]V143 NPVAC HELICASE	81	43	222
3371	1	68	241	gi|1322245	mevalonate pyrophosphate decarboxylase [Rattus norvegicus]	81	62	174
3715	1	475	239	gi|537137	ORF_4388 [Escherichia coli]	81	58	237
3908	1	2	325	gi|439619	[Salmonella typhimurium] IS200 insertion sequence from SRA17, artical.1, gene product [Salmonella typhimurium]	81	68	324
3940	1	3	401	gi|296464	ATPase [Lactococcus lactis]	81	69	399

TABLE 2

B. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match	match	match gene name	% sim	% ident	length (nt)
3954	1	1	318	gi11224069		amidase [Moxarella catarrhalis]	81	68	318
4049	1	337	170	gi1603768		MutI protein, imidazole-5-propionate hydrolase [Bacillus subtilis]	81	68	168
4209	1	1	324	gi1403373		glycerophosphoryl diester phosphodiesterase [Bacillus subtilis]	81	58	324
4371	1	627	322	gi1216677		indolepyruvate decarboxylase [Enterobacter cloacae] pir[S16013]S16013	81	72	306
4387	1	19	228	gi1460689		indolepyruvate decarboxylase (EC 4.1.1.-) - nterobacter cloacae	81	59	210
4191	1	581	306	gi11524193		TUG [Thermactinomyces vulgaris]	81	67	276
4425	1	3	341	gi1143015		unknown [Mycobacterium tuberculosis]	81	66	339
9	1	1593	847	gi11064786		glucuronate kinase [Bacillus subtilis]	80	62	747
17	1	544	311	gi1559164		function unknown [Bacillus subtilis]	80	40	234
45	2	1159	2448	gi1109684		helicase [Autographa californica nuclear polyhedrosis virus]	80	63	1290
45	5	4032	4733	gi1109687		sp1P24307V143_NPVAC HELICASE	80	55	702
54	8	110266	9502	gi1563952		proV [Bacillus subtilis]	80	62	765
62	112	8852	7545	gi1854655		glucuronate perase [Bacillus licheniformis]	80	62	1308
62	114	8087	8683	gi1559713		Na/H antiporter system [Bacillus alcalophilus]	80	68	597
67	16	113781	14122	gi1305002		ORF [Homo sapiens]	80	65	342
70	13	11495	10296	gi11303995		ORF_E356 [Escherichia coli]	80	64	1200
98	9	6136	7130	gi1467428		YqkW [Bacillus subtilis]	80	68	795
98	10	7294	7833	gi1467430		unknown [Bacillus subtilis]	80	64	340
98	11	7820	8737	gi1467431		unknown [Bacillus subtilis]	80	61	918
109	16	114154	14813	gi1580875		high level kasamycin resistance [Bacillus subtilis]	80	63	660
112	15	114294	16636	gi11072361		lpa-57d gene product [Bacillus subtilis]	80	65	2343
139	1	1448	726	gi1506659		pyruvate-formate-lyase [Clostridium pasteurianum]	80	58	723
139	2	2179	1448	gi1506658		CapC [Staphylococcus aureus]	80	59	732
174	4	3271	2870	gi11166242		CapB [Staphylococcus aureus]	80	61	402
						aspartate 1-decarboxylase [Bacillus subtilis]			

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
177	3	2102	2842	gi|467385	unknown [Bacillus subtilis]	80	70	741
184	6	6124	5912	gi|161953	85-kDa surface antigen [Trypanosoma cruzi]	80	46	213
186	4	5368	3875	gi|289282	glucanase [Bacillus subtilis]	80	65	1494
205	30	15796	15140	gi|40103	ribosomal protein L4 [Bacillus stearothermophilus]	80	66	657
207	1	140	1315	gi|460259	enolase [Bacillus subtilis]	80	67	1176
211	3	1078	1590	gi|410131	ORFX7 [Bacillus subtilis]	80	61	513
235	2	1962	2255	gi|143797	valyl-tRNA synthetase (EC 6.1.1.9) VALINE--TRNA LIGASE (VALRS)	80	55	294
239	1	1	1263	gi|143000	proton glutamate symport protein [Bacillus stearothermophilus] pir|S26247|S26247 glutamate/aspartate transport protein - Bacillus stearothermophilus	80	59	1263
272	5	2724	2461	gi|709993	hypothetical protein [Bacillus subtilis]	80	54	264
301	3	1446	1111	gi|467416	unknown [Bacillus subtilis]	80	58	336
310	4	5697	4501	gi|1177686	acuC gene product [Staphylococcus xylosum]	80	67	1197
310	6	5258	7006	gi|348053	acetyl-CoA synthetase [Bacillus subtilis]	80	67	1749
310	7	7410	9133	gi|1103865	formyl-tetrahydrofolate synthetase [Streptococcus mutans]	80	67	1704
325	3	1114	1389	gi|101325	outer capsid protein [Rotavirus sp.]	80	40	276
337	1	1268	636	gi|537049	ORF_0470 [Escherichia coli]	80	55	633
374	2	929	1228	gi|1605448	YnfF [Bacillus subtilis]	80	70	300
375	5	3062	3331	gi|467448	unknown [Bacillus subtilis]	80	68	270
388	1	267	587	gi|1064791	function unknown [Bacillus subtilis]	80	65	321
394	1	9	659	gi|304976	matches P500017: ATP-GTP_A and P500301: EFACITOR_GTP: similar to longation factor G, TetM/TetO tetracycline-resistance proteins [Escherichia coli]	80	65	651
456	1	625	1263	gi|1146183	putative [Bacillus subtilis]	80	65	639
475	1	1	654	gi|288269	beta-fructofuranosidase [Staphylococcus xylosum]	80	66	654
544	2	1449	2240	gi|529754	apeC [Streptococcus pyogenes]	80	50	792
622	4	1623	1871	gi|1483545	unknown [Mycobacterium tuberculosis]	80	65	249
719	1	1	1257	gi|1064791	function unknown [Bacillus subtilis]	80	68	1257
739	1	107	838	gi|1665983	putative ATP binding subunit [Bacillus subtilis]	80	61	732

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
745	2	581	414	gi1511600	[coenzyme PQQ synthesis protein III (Methanococcus jannaschii)]	80	61	168
822	1	17	679	gi1410141	[ORF17 (Bacillus subtilis)]	80	68	653
827	2	991	836	gi1205301	[leukotoxin secretion ATP-binding protein (Haemophilus influenzae)]	80	54	156
1044	1	3	149	gi160632	[vp2 (Marburg virus)]	80	55	147
1220	2	571	413	gi1461072	[galactin precursor - Staphylococcus gallinarum]	80	78	159
2519	1	75	275	gi147556	[tpj (Escherichia coli)]	80	45	201
2947	1	503	279	gi1184680	[polynucleotide phosphorylase (Bacillus subtilis)]	80	62	225
3120	1	2	226	gi1517205	[67 kDa Myosin-crossreactive streptococcal antigen (Streptococcus pyogenes)]	80	65	225
3191	1	294	148	gi151259	[HMG-CoA reductase (EC 1.1.1.86) (Pseudomonas mvalonii) pif144756/A44756 hydrosymethylglutaryl-CoA reductase (EC 1.1.1.86) Pseudomonas sp.]	80	59	147
3560	2	285	434	gi1217130	[photosystem I core protein B (Synechococcus vulcanus)]	80	70	150
3655	1	47	346	gi1415855	[deoxyribose aldolase (Mycoplasma hominis)]	80	56	300
3658	2	324	584	gi1551531	[2-nitropropane dioxygenase (Mycobacterium tuberculosis)]	80	54	261
3769	1	798	400	gi1133950	[large subunit of NADH-dependent glutamate synthase (Plectonema boryanum)]	80	68	399
3781	1	692	348	gi1166412	[NADH-glutamate synthase (Medicago sativa)]	80	62	345
3988	1	48	287	gi11204696	[fructose-permease IIBC component (Haemophilus influenzae)]	80	69	240
4030	1	571	287	gi11009366	[Respiratory nitrate reductase (Bacillus subtilis)]	80	60	285
4092	1	547	275	gi11370207	[orf6 (Lactobacillus sake)]	80	69	273
4103	1	680	342	gi139956	[IIGlc (Bacillus subtilis)]	80	65	319
4231	1	692	348	gi1289287	[UDP-glucose pyrophosphorylase (Bacillus subtilis)]	80	65	345
4265	1	595	299	gi1603768	[HutI protein, imidazolone-5-propiolate hydrolase (Bacillus subtilis) gi1603768 HutI protein, imidazolone-5-propiolate hydrolase (Bacillus subtilis)]	80	63	297
4504	1	498	250	gi11339950	[large subunit of NADH-dependent glutamate synthase (Plectonema boryanum)]	80	68	249
2	6	5998	6798	gi1535351	[CodY (Bacillus subtilis)]	79	63	801
4	7	8295	7057	gi1603768	[HutI protein, imidazolone-5-propiolate hydrolase (Bacillus subtilis) gi1603768 HutI protein, imidazolone-5-propiolate hydrolase (Bacillus subtilis)]	79	64	1245
25	6	5273	5515	gi1436728	[acyl carrier protein - Rhizobium meliloti]	79	65	243

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
59	2	1173	1424	gi|147923	threonine dehydratase 2 (EC 4.2.1.16) [Escherichia coli]	79	75	252
60	1	1	204	gi|666115	orf1 upstream of glucose kinase [Staphylococcus xylosum] pir|S52351|S52351 hypothetical protein 1 - Staphylococcus xylosum	79	60	204
81	1	3002	3590	gi|466882	pps1; B1490_C2_189 [Mycobacterium leprae]	79	64	1413
85	7	7023	6505	gi|143364	phosphoribosyl aminimidazole carboxylase I (Pur-E) [Bacillus subtilis]	79	60	519
89	6	5660	4554	gi|144906	product homologous to E. coli thioredoxin reductase; J. Biol. Chem. 1988) 263:9015-9019, and to F52a protein of alkyl hydroperoxide oxidase from S. typhimurium; J. Biol. Chem. (1990) 265:10535-10540; pen reading frame A [Clostridium pasteurianum]	79	35	1107
102	11	7489	8571	gi|143093	Ketol-acid reductoisomerase [Bacillus subtilis] sp|P37253|ILVC_BACSU_METOL-ACID_REDUCTOISOMERASE (EC 1.1.1.46) ACETOHYDROXY-ACID ISOMEROREDUCTASE (ALPHA-KETO-BETA-HYDROXYLACIL EDUCTOISOMERASE)	79	64	1083
102	14	11190	12563	gi|149428	putative [Lactococcus lactis]	79	65	1374
127	9	7792	9372	gi|1458888	PrfC/RF3 [Dichelobacter nodosus]	79	68	1581
139	3	2540	1983	gi|506697	CapA [Staphylococcus aureus]	79	55	558
144	2	1644	1156	gi|1498296	peptide methionine sulfoxide reductase [Streptococcus pneumoniae]	79	47	489
148	2	529	1098	gi|467457	hypoxanthine-guanine phosphoribosyltransferase [Bacillus subtilis] gi|467457 hypoxanthine-guanine phosphoribosyltransferase [Bacillus subtilis]	79	59	570
150	1	965	591	gi|755602	unknown [Bacillus subtilis]	79	61	375
176	1	1039	587	gi|297874	fructose-bisphosphate aldolase [Staphylococcus carnosus] pir|A49943|A49943 fructose-bisphosphate aldolase (EC 4.1.2.13) - taphylococcus carnosus (strain TM300)	79	65	453
186	7	7584	6874	gi|1314298	ORF5; putative Sma protein; similar to Sma proteins from Haemophilus influenzae and Escherichia coli [Listeria monocytogenes]	79	64	711
205	16	8887	8498	gi|1044980	ribosomal protein L18 [Bacillus subtilis]	79	70	390
211	1	1	519	gi|1303994	YqkM [Bacillus subtilis]	79	62	519
223	2	4183	2801	gi|488430	alcohol dehydrogenase 2 [Entamoeba histolytica]	79	60	1383
243	8	8915	7896	gi|580883	ipa-88d gene product [Bacillus subtilis]	79	60	1020
279	4	3721	4329	gi|413930	ipa-6d gene product [Bacillus subtilis]	79	59	609
300	1	11	1393	gi|403372	glycerol 3-phosphate permease [Bacillus subtilis]	79	62	1383
307	3	2930	1935	gi|950062	hypothetical yeast protein 1 [Mycoplasma capricolum] pir|S48578|S48578 hypothetical protein - Mycoplasma capricolum SCC3 (fragment)	79	60	996

TABLE 2

S. aureus - putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
352	6	10106	8886	gi|216854	P47K [Pseudomonas chlororaphis]	79	59	1221
412	1	1153	578	gi|143177	putative [Bacillus subtilis]	79	51	576
481	3	621	1124	gi|786163	Ribosomal Protein L10 [Bacillus subtilis]	79	66	504
516	1	702	352	gi|805090	NisP [Lactococcus lactis]	79	48	351
525	2	2457	1426	gi|143371	phosphoribosyl aminimidazole synthetase (PUR-M) [Bacillus subtilis] pir|W9126|A385C1 phosphoribosylformylglycinamide cyclo-ligase BC 6.3.3.1 - Bacillus subtilis	79	61	1032
538	4	3448	2825	gi|1370207	orf6 [Lactobacillus sake]	79	67	624
570	1	2	421	gi|476160	arginine permease substrate-binding subunit [Listeria monocytogenes]	79	61	420
645	8	2663	3241	gi|151898	transport protein [Salmonella typhimurium]	79	62	579
683	1	75	374	gi|1064795	function unknown [Bacillus subtilis]	79	62	300
816	3	4700	3987	gi|140784	orf-1; novel antigen [Staphylococcus aureus]	79	61	714
2929	1	3	401	gi|1524397	glycine betaine transporter OpuD [Bacillus subtilis]	79	61	399
2937	1	357	202	pir|552915|5529	nitrate reductase alpha chain - Bacillus subtilis (fragment)	79	58	156
2940	1	768	385	gi|149429	putative [Lactococcus lactis]	79	72	384
2946	1	570	286	gi|143267	2-oxoglutarate dehydrogenase (odhA; EC 1.2.4.2) [Bacillus subtilis]	79	61	285
2999	1	3	212	gi|710020	nitrite reductase (nirB) [Bacillus subtilis]	79	59	210
3022	1	514	332	gi|450686	3-phosphoglycerate kinase [Thermotoga maritima]	79	61	183
3064	1	3	314	gi|1204436	pyruvate formate-lyase [Haemophilus influenzae]	79	60	312
3083	1	2	220	gi|1149662	hlyD gene product [Clostridium perfringens]	79	56	219
3126	1	701	411	gi|1339950	large subunit of NADH-dependent glutamate synthase [Plectonema boryanum]	79	55	291
3181	1	607	326	gi|1339950	large subunit of NADH-dependent glutamate synthase [Plectonema boryanum]	79	59	282
3145	1	3	476	gi|871784	Clp-like ATP-dependent protease binding subunit [Bos taurus]	79	63	474
3718	1	536	270	pir|C36889|C368	leuB protein, inactive - Lactococcus lactis subsp. lactis (strain IL1403)	79	71	267
3724	2	159	401	gi|1009366	Respiratory nitrate reductase [Bacillus subtilis]	79	64	243
3836	1	608	312	gi|1524193	unknown [Mycobacterium tuberculosis]	79	65	297
3941	1	2	334	gi|415855	deoxyribose aldolase [Mycoplasma hominis]	79	54	333
4113	1	3	341	gi|143013	gluconate kinase [Bacillus subtilis]	79	63	339

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF In	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
4501	1	406	209	[gi|1022726	unknown [Staphylococcus haemolyticus]	79	66	198
4632	1	2	238	[gi|460689	TVO (Thermosactinomyces vulgaris)	79	58	237
2	1	2	1213	[gi|520753	DNA topoisomerase I [Bacillus subtilis]	78	64	1212
8	2	2266	1220	[gi|216151	DNA polymerase (gene 1; ttg start codon) [Bacteriophage SP02] gi|579197 SP02 DNA polymerase (aa 1-648) [Bacteriophage SP02] pIR|A21498|QUBPS2 DNA-directed DNA polymerase (SC 2.7.7) - phage P02	78	72	1067
9	2	1340	1089	[gi|1064787	function unknown [Bacillus subtilis]	78	57	252
32	8	6803	7702	[gi|146974	NH3-dependent NAD synthetase [Escherichia coli]	78	63	900
36	4	2941	3138	[gi|290503	glutamate permease [Escherichia coli]	78	53	198
53	15	17684	16221	[gi|1303941	Yqiv [Bacillus subtilis]	78	58	1464
57	14	10520	12067	[gi|1072418	glcA gene product [Staphylococcus carnosus]	78	65	1548
66	7	6798	5812	[gi|1212729	Yqj3 [Bacillus subtilis]	78	67	987
67	6	4029	4376	[gi|466612	Ynka [Escherichia coli]	78	71	348
91	9	10058	10942	[gi|467380	stage 0 sporulation [Bacillus subtilis]	78	50	885
102	12	8574	10130	[gi|149426	putative [Lactococcus lactis]	78	61	1557
112	6	3540	4463	[gi|854234	cymC gene product [Klebsiella oxytoca]	78	56	924
124	2	1888	1061	[gi|405622	unknown [Bacillus subtilis]	78	60	828
130	3	1805	2260	[gi|1256636	putative [Bacillus subtilis]	78	71	456
133	1	751	377	[gi|168060	YanB [Emericella nidulans]	78	59	375
166	4	7125	6163	[gi|451216	mannosephosphate isomerase [Streptococcus mutans]	78	63	963
186	1	1586	795	[gi|289284	cysteineyl-tRNA synthetase [Bacillus subtilis]	78	63	792
195	4	2749	2315	[gi|1353874	unknown [Rhodobacter capsulatus]	78	58	435
199	3	4279	3623	[gi|143525	succinate dehydrogenase cytochrome b-558 subunit [Bacillus subtilis] pIR|A29843|DEBSSC succinate dehydrogenase [EC 1.3.99.1] cytochrome 558 - Bacillus subtilis	78	57	657
199	4	7209	5557	[gi|142521	deoxyribodipyrimidine photolyase [Bacillus subtilis] pIR|A37192|A37192 uvrB protein - Bacillus subtilis sp|P14951|UVR_C	78	62	1653
223	3	3831	3523	[gi|139596	[Escherichia coli 19200 insertion sequence from ECOR63, partial 1, ene product [Escherichia coli]	78	47	309

TABLE 2

S. aureus - putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
299	4	1865	2149	gi1467439	temperature sensitive cell division [Bacillus subtilis]	78	62	285
321	9	7734	7315	gi1142979	ORF3 is homologous to an ORF downstream of the spot gene of S. coli; RP3 [Bacillus stearothermophilus]	78	55	420
332	4	3714	3944	gi1349050	lectin I [Pneumocystis carinii]	78	42	231
332	5	7592	6093	gi1903587	NADH dehydrogenase subunit 5 [Bacillus subtilis] sp[P19755]NDHP BACSU NADH DEHYDROGENASE SUBUNIT 5 (EC 1.6.5.3) NADH-UBIQUINONE OXIDOREDUCTASE CHAIN 5)	78	58	1500
376	1	2	583	gi1551493	dethiobiotin synthase [Bacillus sphaericus]	78	34	582
424	2	1595	1788	gi11524117	alpha-acetolactate decarboxylase [Lactococcus lactis]	78	68	174
450	1	1914	988	gi11030068	NAD(P)H oxidoreductase, isoform reductase homologue [Solanum tuberosum]	78	63	927
558	1	762	562	gi11511588	blfunctional protein [Methanococcus jannaschii]	78	60	201
670	3	1152	1589	gi1122759	unknown [Bacillus subtilis]	78	64	438
714	1	64	732	gi1143460	37 kd minor sigma factor (rpoF, sigB; ttg start codon) [Bacillus subtilis]	78	57	669
n14	1	3	368	gi11377833	unknown [Bacillus subtilis]	78	59	366
981	1	1381	692	gi1143802	GerC2 [Bacillus subtilis]	78	64	690
995	2	978	727	gi1296947	uridine kinase [Escherichia coli]	78	64	252
1045	1	3	401	gi11407784	orf-1; novel antigen [Staphylococcus aureus]	78	61	399
1163	2	368	186	gi1410117	ulaminopimelate decarboxylase [Bacillus subtilis]	78	54	183
2191	1	794	399	gi1215098	lecithinase [Bacteriophage 151a]	78	65	396
2933	1	2	181	gi11204436	pyruvate formate-lyase [Haemophilus influenzae]	78	73	180
3041	2	129	317	gi1624632	CitL [Escherichia coli]	78	53	189
3581	1	105	401	gi1763186	3-ketoacyl-coA thiolase [Saccharomyces cerevisiae]	78	55	297
3709	1	3	230	gi1460689	TVG [Thermactinomyces vulgaris]	78	58	228
3974	1	528	265	gi1558839	unknown [Bacillus subtilis]	78	65	264
3980	1	3	401	gi139956	ITDc [Bacillus subtilis]	78	62	399
4056	1	647	354	gi11256635	ldihydroxy-acid dehydratase [Bacillus subtilis]	78	55	294
4114	1	630	316	gi1509372	hypothetical protein - Trypanosoma brucei	78	62	315
4185	1	3	179	gi11339950	large subunit of NADH-dependent glutamate synthase [Plectonana boryanum]	78	58	177

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
4235	1	655	339	gi|1558839	unknown [Bacillus subtilis]	78	60	327
4352	1	541	302	gi|603768	Hut1 protein, imidazolone-5-propionate hydrolase [Bacillus subtilis] gi|403768 Hut1 protein, imidazolone-5-propionate hydrolase [Bacillus subtilis]	78	63	240
4368	1	612	307	gi|1353678	heavy-metal transporting P-type ATPase [Proteus mirabilis]	78	59	306
4461	1	428	216	gi|1276841	glutamate synthase (GOGAT) [Porphyra purpurea]	78	36	213
4530	1	474	238	gi|19956	triglic [Bacillus subtilis]	78	65	237
3	2	2969	2073	gi|1109684	ProV [Bacillus subtilis]	77	56	897
12	2	2426	1965	gi|467335	ribosomal protein L9 [Bacillus subtilis]	77	59	462
27	1	2	388	gi|1212728	YqhI [Bacillus subtilis]	77	63	387
39	2	590	1252	gi|40054	phenylalanyl-tRNA synthetase beta subunit (AA 1-804) [Bacillus subtilis]	77	60	663
42	6	2704	2931	gi|606241	30S ribosomal subunit protein S14 [Escherichia coli] sp|P02370|RS14_ECOLI 30S RIBOSOMAL PROTEIN S14. (SUB 2-101)	77	65	228
46	1A	1459	16622	gi|297798	mitochondrial formate dehydrogenase precursor [Solanum tuberosum] pit|0272|02722 formate dehydrogenase (EC 1.2.1.2) precursor. [mitochondrial] - potato	77	55	1164
100	4	4562	4002	gi|1340128	ORF1 [Staphylococcus aureus]	77	54	561
102	8	5378	5713	gi|1311482	acetolactate synthase (Thermus aquaticus)	77	57	336
109	7	4742	5383	gi|710637	unknown [Bacillus subtilis]	77	56	642
117	1	2	1228	gi|1237015	ORF4 [Bacillus subtilis]	77	53	1227
124	10	8323	7688	gi|403819	thymidine kinase [Bacillus subtilis]	77	63	836
147	3	1146	985	gi|849027	hypothetical 15.9-kDa protein [Bacillus subtilis]	77	37	162
152	10	7354	7953	gi|1205583	spermidine/putrescine transport ATP-binding protein [Haemophilus influenzae]	77	55	600
169	2	1004	1282	gi|473825	'elongation factor EF-Ts' [Escherichia coli]	77	58	279
184	2	380	1147	gi|216314	esterase [Bacillus stearothermophilus]	77	60	768
189	7	3296	3668	gi|853809	ORF3 [Clostridium perfringens]	77	48	573
193	1	132	290	gi|1303788	YqeH [Bacillus subtilis]	77	54	159
195	8	8740	8414	gi|1499620	M. Jannaschii predicted coding region M0798 [Methanococcus jannaschii]	77	44	327
205	8	5428	5204	gi|216340	ORF for adenylate kinase [Bacillus subtilis]	77	61	225

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
205	29	14795	14502	gi|786155	Ribosomal Protein L23 [Bacillus subtilis]	77	62	294
211	5	1508	2084	gi|410132	ORFX8 [Bacillus subtilis]	77	47	177
217	5	3478	4416	gi|496254	fibrinectin/fibrinogen-binding protein [Streptococcus pyogenes]	77	54	939
222	1	267	998	gi|1407784	orf-1; novel antigen [Staphylococcus aureus]	77	57	732
233	2	1819	1346	gi|467408	unknown [Bacillus subtilis]	77	61	474
243	3	2661	2299	gi|516155	unconventional myosin [Sus scrofa]	77	32	363
299	1	68	769	gi|467436	unknown [Bacillus subtilis]	77	54	702
301	4	1468	1283	gi|950071	ATP-bind. pyruvate kinase [Mycoplasma capricolum] pir[S48605]S48605 hypothetical protein - Mycoplasma capricolum SCC3 (fragment)	77	48	186
302	5	2741	3211	gi|508960	pheB [Bacillus subtilis]	77	57	471
302	7	3835	4863	gi|147783	ruvs protein [Escherichia coli]	77	60	1029
307	9	5402	4797	gi|1070015	protein-dependent [Bacillus subtilis]	77	60	606
312	1	99	1391	gi|143165	malic enzyme (EC 1.1.1.38) [Bacillus stearothermophilus] pir[A33307]PBBSXS malate dehydrogenase oxaloacetate-decarboxylating (EC 1.1.1.38) - Bacillus stearothermophilus	77	62	1293
312	2	1541	2443	gi|1399855	carboxyltransferase beta subunit [Synecoccus PCC7942]	77	58	903
321	5	5666	4596	gi|39844	fumarate (citG) [aa 1-462] [Bacillus subtilis]	77	65	1071
354	1	47	568	gi|1154634	VmaR [Bacillus subtilis]	77	57	522
365	1	2	1021	gi|143374	phosphoribosyl glycineamide synthetase (PUR-D; gta start codon) [Bacillus subtilis]	77	62	1020
374	1	1	708	gi|1405446	transketolase [Bacillus subtilis]	77	61	708
385	1	1128	565	gi|533099	endonuclease III [Bacillus subtilis]	77	63	564
392	2	594	1940	gi|556014	UDP-N-acetyl muramate-alanine ligase [Bacillus subtilis] SD[P40778]MURC_BACSU UDP-N-ACETYLURAMATE--ALANINE LIGASE (EC 3.2.8) (UDP-N- ACETYLURAMATE--L-ALANINE SYNTHETASE) (FRAGMENT)	77	65	1347
405	5	4079	3570	gi|1303912	Vqhw [Bacillus subtilis]	77	64	510
487	4	1302	1472	gi|432427	ORF1 gene product [Acinetobacter calcoaceticus]	77	48	171
522	1	2	562	pir[A01179]SVNS	tyrosine--tRNA ligase (EC 6.1.1.1) - Bacillus stearothermophilus	77	63	561

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match (%)	gene name	% sim	% ident	length (nt)
523	2	1587	1351	gi|1387979		44% identity over 302 residues with hypothetical protein from <i>Synechocystis</i> sp. accession D64006_CD; expression induced by environmental stress; some similarity to glycosyl transferases; two potential membrane-spanning helices [Bacillus subtilis]	77	48	237
536	2	983	612	gi|1413366		adenylosuccinate lyase (Pur-B) [Bacillus subtilis] pir|C29336|W28SDS adenylosuccinate lyase (EC 4.3.2.2) - Bacillus subtilis	77	61	372
548	2	339	872	gi|1413387		aspartate transcarbamylase [Bacillus subtilis]	77	56	534
597	1	2	481	gi|904198		hypothetical protein [Bacillus subtilis]	77	33	480
633	2	1747	1313	gi|1387577		ORF1A [Bacillus subtilis]	77	64	435
642	1	85	360	gi|46971		epiP gene product [Staphylococcus epidermidis]	77	61	276
659	1	125	1219	gi|1072381		glutamy-aminopeptidase [Lactococcus lactis]	77	62	1095
670	4	1587	1820	gi|1122760		unknown [Bacillus subtilis]	77	58	234
789	1	2	391	gi|1377823		aminopeptidase [Bacillus subtilis]	77	65	390
815	1	10	572	gi|1303861		YqgW [Bacillus subtilis]	77	49	564
849	1	1	225	gi|1204844		H. influenzae predicted coding region H10594 [Haemophilus influenzae]	77	55	225
1083	1	3	188	gi|460828		8969 [Saccharomyces cerevisiae]	77	66	186
1942	1	415	209	gi|160047		p101/acidic basic repeat antigen [Plasmodium falciparum] p1r|A29232|A29232 101K malaria antigen precursor - Plasmodium falciparum (strain Camp)	77	38	207
2559	1	1	171	gi|1499034		M. jannaschii predicted coding region M30255 [Methanococcus jannaschii]	77	61	171
2933	2	243	401	gi|42370		pyruvate formate-lyase (AA 1-760) [Escherichia coli] prf|S01788|S01788 formate C-acetyltransferase (EC 2.3.1.54) - Escherichia coli	77	72	159
2966	1	56	292	gi|1524397		glycine betaine transporter Opud [Bacillus subtilis]	77	45	237
2976	1	614	309	gi|40003		oxoglutarate dehydrogenase (NADP+) [Bacillus subtilis] p|B23129|D001_BACSU 2-OXOGLUTARATE DEHYDROGENASE E1 COMPONENT (EC 2.4.2) (ALPHA-KETOGLUTARATE DEHYDROGENASE)	77	60	306
2979	2	678	400	gi|1204354		spore germination and vegetative growth protein [Haemophilus influenzae]	77	61	279
2988	1	601	377	gi|438465		Probable operon with orf. Possible alternative initiation codon. ases 2151-2153. Homology with acetyltransferases; putative Bacillus subtilis	77	55	225
2990	1	331	167	gi|142562		ATP synthase epsilon subunit [Bacillus megaterium] p1r|B28599|PB28599 H+-transporting ATP synthase (EC 3.6.1.34) psilon chain - Bacillus megaterium	77	63	165
3032	1	3	389	gi|488430		alcohol dehydrogenase 2 [Entamoeba histolytica]	77	56	387
3057	1	1	195	gi|468764		mock gene product [Rhizobium meliloti]	77	50	195

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
4008	1	726	400	gi|603768	HutI protein, imidazole-5-propionate hydrolase [Bacillus subtilis]	77	52	327
4040	1	703	386	gi|216278	Gramicidin S synthetase 1 [Bacillus brevis]	77	55	318
4110	1	3	368	pir|S52915|S529	Nitrate reductase alpha chain - Bacillus subtilis (fragment)	77	61	366
4115	1	1	348	gi|517205	167 kDa Myosin-crossreactive streptococcal antigen [Streptococcus yogenes]	77	65	348
4225	1	590	297	gi|1322245	mevalonate pyrophosphate decarboxylase [Rattus norvegicus]	77	60	294
4611	2	494	327	gi|508979	GTP-binding protein [Bacillus subtilis]	77	57	168
4668	1	361	182	pir|S52915|S529	Nitrate reductase alpha chain - Bacillus subtilis (fragment)	77	61	180
25	1	2	1627	gi|1150620	HnsA [Streptococcus pneumoniae]	76	56	1626
38	5	1488	2537	pir|A43577|A435	regulatory protein pfoR - Clostridium perfringens	76	57	1050
52	5	2962	4041	gi|1161061	Idoxigenase [Methylobacterium extorquens]	76	62	1080
56	120	27389	27955	gi|467402	unknown [Bacillus subtilis]	76	56	567
57	15	12046	12219	gi|1206040	Weak similarity to keratin [Caenorhabditis elegans]	76	40	174
91	2	1062	2261	gi|475715	Acetyl coenzyme A acetyltransferase (thiolase) [Clostridium acetobutylicum]	76	57	1200
96	2	818	1624	gi|467422	unknown [Bacillus subtilis]	76	62	807
96	5	2965	3228	gi|897793	ly98 gene product [Bacillus subtilis]	76	52	264
98	8	5922	6326	gi|467427	methionyl-tRNA synthetase [Bacillus subtilis]	76	53	405
104	3	1322	1885	gi|216151	DNA polymerase (gene L; ttg start codon) [Bacteriophage SP02] gi|579197	76	63	564
					SP02 DNA polymerase (aa 1-648) [Bacteriophage SP02] pir|A21498|DJBPS2 DNA-directed DNA polymerase [EC 2.7.7.7] - phage P02			
124	9	8134	7055	gi|853776	peptide chain release factor 1 [Bacillus subtilis] pir|S55437|S55437	76	58	1080
					peptide chain release factor 1 - Bacillus ubilis			
164	5	2832	3311	gi|1204976	prolyl-tRNA synthetase [Haemophilus influenzae]	76	53	480
168	2	2617	1841	gi|1177253	putative ATP-binding protein of ABC-type [Bacillus subtilis]	76	58	777
189	2	163	888	gi|467384	unknown [Bacillus subtilis]	76	63	726
235	3	2253	3518	gi|142936	[poly]-polyglutamate synthetase [Bacillus subtilis] pir|B40646|B40646 foic - Bacillus subtilis	76	53	1266
236	1	335	925	gi|1146197	putative [Bacillus subtilis]	76	54	591
237	8	5323	5541	gi|279261	PI303.6 [Caenorhabditis elegans]	76	47	219

TABLE 2

S. aureus - putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
283	5	5490	4385	gi11510346	[dihydrodipicolinate synthase (Methanococcus jannaschii)]	76	49	906
304	3	1051	1794	gi1666982	[putative membrane spanning subunit (Bacillus subtilis) p1r|S52382|S52382 probable membrane spanning protein - Bacillus subtilis]	76	60	744
312	4	3613	4624	gi1143312	[6-phospho-1-fructokinase (gtg start codon; EC 2.7.1.11) (Bacillus tharothermophilus)]	76	56	1014
343	1	2	1016	gi1405956	[yeeE (Escherichia coli)]	76	59	1035
347	1	409	1701	gi1396304	[acetylornithine deacetylase (Escherichia coli)]	76	72	1293
358	1	672	1307	gi1146215	[39.0% identity to the Escherichia coli S1 ribosomal protein; putative (Bacillus subtilis)]	76	58	1236
371	1	1	222	gi1537084	[alternate gene name met; CG Site No. 497 (Escherichia coli) p1r|S56468|S56468 mgtA protein - Escherichia coli]	76	61	222
379	4	4331	4858	gi1143268	[dihydrolipamide transuccinylase (odhA; EC 2.3.1.61) (Bacillus subtilis)]	76	61	528
404	5	4022	4492	gi11303823	[yqg (Bacillus subtilis)]	76	60	471
411	1	2	307	gi1386025	[ORF YKLO27w (Saccharomyces cerevisiae)]	76	55	306
412	3	4156	2854	gi11405464	[A1st (Bacillus subtilis)]	76	57	1503
546	1	273	995	gi1153821	[streptococcal pyrogenic exotoxin type C (speC) precursor Streptococcus pyogenes]	76	36	723
588	1	1054	557	gi11002520	[NucS (Bacillus subtilis)]	76	61	498
591	1	16	735	gi1885934	[C1p8 (Synecoccus sp.)]	76	44	720
602	2	175	798	gi11486422	[OppD homologue (Rhizobium sp.)]	76	52	624
619	2	547	290	gi1330613	[major capsid protein (Human cytomegalovirus)]	76	47	258
660	4	2568	3302	gi1904199	[hypothetical protein (Bacillus subtilis)]	76	55	735
677	1	452	228	gi140177	[spoOF gene product (Bacillus subtilis)]	76	58	225
962	1	24	206	gi1142443	[adenylosuccinate synthetase (Bacillus subtilis) sp|P29726|PURA_BACSU ADENYLOSUCCINATE SYNTHETASE (EC 6.3.4.4) IMP--ASPARTATE LIGASE]	76	67	183
978	1	1158	580	gi11511333	[M. jannaschii predicted coding region M3122 (Methanococcus jannaschii)]	76	56	579
997	1	486	244	gi1467154	[No definition line found (Mycobacterium leprae)]	76	38	243
1563	1	529	266	gi11303984	[yqg (Bacillus subtilis)]	76	52	264
2184	1	361	182	gi1506706	[CapJ (Staphylococcus aureus)]	76	38	180
2572	1	1	387	gi1153898	[transport protein (Salmonella typhimurium)]	76	65	387

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	seq gene name	% sim	% ident	length (nt)
2942	1	29	400	gi|710020	nitrite reductase (nirB) [Bacillus subtilis]	76	59	372
2957	1	377	216	gi|1511251	hypothetical protein (SP:942604) [Methanococcus jannaschii]	76	47	162
2980	1	554	279	gi|1403464	Alst [Bacillus subtilis]	76	53	276
3015	1	649	326	gi|408115	ornithine acetyltransferase [Bacillus subtilis]	76	61	324
3124	1	13	174	gi|882705	ORF_0401 [Escherichia coli]	76	65	162
3179	1	3	161	gi|168477	ferredoxin-dependent glutamate synthase [Zea mays] p1r[A38596/A38596 glutamate synthase (ferredoxin) (EC 1.4.7.1) - also	76	53	159
3789	1	2	379	gi|39956	IIIGlc [Bacillus subtilis]	76	55	378
3892	1	3	314	gi|1510398	ferritinocellin binding protein [Methanococcus jannaschii]	76	52	312
3928	1	798	400	gi|143016	permease [Bacillus subtilis]	76	59	399
4159	1	757	386	sp|P80544|HRSF_	METHICILLIN-RESISTANT SURFACE PROTEIN (FRAGMENTS)	76	66	372
4204	1	17	331	gi|296464	ATPase [Lactococcus lactis]	76	56	315
4398	1	494	249	gi|987255	Menkes disease gene (Homo sapiens)	76	48	246
4506	1	2	313	gi|216746	D-lactate dehydrogenase [Lactobacillus plantarum]	76	47	312
4546	1	477	247	gi|1339950	large subunit of NADH-dependent glutamate synthase [Plectonema boryanum]	76	61	231
4596	1	379	191	gi|560027	cellulose synthase [Acetobacter xylinum]	76	70	189
4	5	5257	4337	gi|882532	ORF_0294 [Escherichia coli]	75	59	921
6	1	164	952	gi|40960	OTCase [Escherichia coli]	75	56	789
12	3	5935	3944	gi|467336	unknown [Bacillus subtilis]	75	57	1992
23	18	18272	17310	gi|1296433	O-acetylserine sulphydrylase B [Alcaligenes eutrophus]	75	55	963
25	3	2356	3393	gi|1502419	Plax [Bacillus subtilis]	75	56	1038
36	8	5765	6037	gi|1256517	unknown [Schizosaccharomyces pombe]	75	45	273
46	13	11186	12058	gi|48972	nitrate transporter [Synechococcus sp.]	75	46	873
51	7	3474	3877	gi|143607	sporulation protein [Bacillus subtilis]	75	61	204
53	16	16850	16590	gi|143402	recombination protein (tsg start codon), [Bacillus subtilis] gi|1303923 RecW [Bacillus subtilis]	75	51	261
74	3	3572	2568	gi|1204847	ornithine carbamoyltransferase [Haemophilus influenzae]	75	61	1005

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
85	3	4628	3930	gi1143368	phosphoribosylformyl glycinamide synthetase I (PUR-L; gtc start odon) (Bacillus subtilis)	75	63	699
85	5	5588	4878	gi1143367	phosphoribosyl aminodazole succinocarboxamide synthetase (PUR-C; gtc start codon) (Bacillus subtilis)	75	55	711
85	8	6625	7530	gi11303916	yglA (Bacillus subtilis)	75	53	906
87	3	2340	3590	gi11064813	homologous to sp:PHOR-BACSU (Bacillus subtilis)	75	56	1251
87	6	6084	6896	gi11064810	function unknown (Bacillus subtilis)	75	61	813
108	2	1844	1503	gi11001824	hypothetical protein (Synecocystis sp.)	75	51	342
110	3	1748	3727	gi11147593	putative ppGpp synthetase (Streptomyces coelicolor)	75	55	1980
110	7	4753	5252	gi11177251	clpD gene product (Bacillus subtilis)	75	75	900
120	14	11266	10649	gi11524394	ORF-2 upstream of gbaAB operon (Bacillus subtilis)	75	55	618
121	5	2050	4221	gi11154632	hrdE (Bacillus subtilis)	75	54	2172
124	1	283	143	gi1405622	unknown (Bacillus subtilis)	75	56	141
128	1	81	1139	gi1143316	[gmp] gene products (Bacillus megaterium)	75	48	1059
130	8	5760	5903	gi11256654	54.8% identity with Neisseria gonorrhoeae regulatory protein PilB; putative (Bacillus subtilis)	75	62	143
136	2	4480	3185	gi1467403	seryl-tRNA synthetase (Bacillus subtilis)	75	54	1296
161	10	5439	5798	gi11001195	hypothetical protein (Synecocystis sp.)	75	55	360
172	4	3819	2995	gi11755153	ATP-binding protein (Bacillus subtilis)	75	52	825
179	1	2024	1107	gi1143037	porphobilinogen deaminase (Bacillus subtilis)	75	58	918
195	10	9529	9374	gi11025745	HYPOTHETICAL PROTEIN IN PUBB 5'-REGION (ORF-15) (FRAGMENT)	75	60	156
200	4	2605	4596	gi1142440	ATP-dependent nuclease (Bacillus subtilis)	75	56	1992
206	3	6900	5620	gi11256135	ybbP (Bacillus subtilis)	75	53	1281
216	2	159	389	gi11052800	unknown (Schizosaccharomyces pombe)	75	58	231
229	1	29	847	gi11205958	branched chain aa transport system II carrier protein (Haemophilus influenzae)	75	49	819
230	2	518	1714	gi11971337	nitrite extrusion protein (Bacillus subtilis)	75	53	1197
231	1	2240	1122	gi11002521	MutL (Bacillus subtilis)	75	54	1119
233	3	1314	1859	gi1467405	unknown (Bacillus subtilis)	75	59	546

TABLE 2

3. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
269	1	125	184	[gi11511246]	[methyl coenzyme M reductase system, component A2 [Methanococcus jannaschii]]	75	50	162
292	1	1389	772	[gi11511604]	[M. jannaschii predicted coding region M1651 [Methanococcus jannaschii]]	75	46	618
304	4	1773	2261	[gi1205328]	[surfactin [Haemophilus influenzae]]	75	55	489
312	3	2437	3387	[gi1285621]	[undefined open reading frame [Bacillus stearothermophilus]]	75	62	951
312	5	4622	6403	[gi11041097]	[Pyruvate Kinase [Bacillus psychrophilus]]	75	57	1782
319	1	353	877	[gi11212728]	[Yqhi [Bacillus subtilis]]	75	54	525
320	5	4321	5031	[gi11070361]	[OMP decarboxylase [Lactococcus lactis]]	75	56	711
320	6	5010	5862	[gi1143394]	[OMP-PRP transferase [Bacillus subtilis]]	75	60	833
337	4	1519	2088	[gi1487433]	[citrate synthase II [Bacillus subtilis]]	75	58	570
394	2	669	1271	[gi1304976]	[matches PS00017: ATP-GTP_A and PS00301: EFACITOR_GTP: similar to longation factor G, TetH/TetO tetracycline-resistance proteins Escherichia coli]]	75	51	603
423	1	127	570	[gi11181839]	[unknown [Pseudomonas aeruginosa]]	75	59	444
433	2	1603	1929	[gi1149211]	[acetolactate synthase [Klebsiella pneumoniae]]	75	63	327
446	2	176	1540	[gi1312441]	[dihydroorotase [Bacillus caldolyticus]]	75	62	1365
486	1	494	249	[gi11145682]	[potP gene product [Clostridium perfringens]]	75	55	246
496	1	3	794	[gi1143582]	[spoIIIEA protein [Bacillus subtilis]]	75	59	792
498	2	824	1504	[gi1143328]	[phoP protein (put.); putative [Bacillus subtilis]]	75	47	681
499	2	1061	1824	[gi1138799]	[44% identity over 302 residues with hypothetical protein from Synecocystis sp., accession D64006.CD; expression induced by environmental stress; some similarity to glycosyl transferases; two potential membrane-spanning helices [Bacillus subtilis]]	75	51	564
568	1	641	453	[ptr1JC4110JC41]	[triacylglycerol lipase (EC 3.1.1.3) 2 - Mycoplasma mycoides subsp. mycoides (SGC3)]	75	50	189
613	2	430	233	[gi1330993]	[tegument protein [Saimirine herpesvirus 2]]	75	75	198
621	1	1	525	[gi1529754]	[speC [Streptococcus pyogenes]]	75	43	525
642	5	1809	2474	[gi11176401]	[EniG [Staphylococcus epidermidis]]	75	51	666
646	2	454	657	[gi1172482]	[ribonuclease P [Saccharomyces cerevisiae]]	75	37	204
657	1	3	347	[gi1862541]	[OMP_0236 [Bacteriophila coli]]	75	47	345
750	1	1662	832	[gi146971]	[epiP gene product [Staphylococcus epidermidis]]	75	57	831

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
754	1	2	481	gi11031901	[yqhF] [Bacillus subtilis]	75	57	480
763	2	563	393	gi11205145	[multidrug resistance protein] [Haemophilus influenzae]	75	51	171
775	1	961	482	pir1B36889|B368	[leuA protein, inactive - Lactococcus lactis subsp. lactis (strain IL1403)]	75	63	480
793	1	1	180	gi1143316	[gcp] gene products [Bacillus megaterium]	75	57	180
800	1	318	160	gi1509411	[NFR1 protein] [Azorhizobium caulinodans]	75	34	159
811	1	1117	560	gi1143434	[rho factor] [Bacillus subtilis]	75	60	558
940	1	493	329	gi11276985	[arginase] [Bacillus caldovelox]	75	50	165
971	2	37	252	gi11001373	[hypothetical protein] [Synecocystis sp.]	75	58	216
1059	1	384	232	gi11726480	[L-glutamine-D-fructose-6-phosphate amidotransferase] [Bacillus subtilis]	75	67	153
1109	2	219	374	gi1143331	[alkaline phosphatase regulatory protein] [Bacillus subtilis] pir1A27630|A27630 regulatory protein phoR - Bacillus subtilis sp|P23344|PHO_R_BACSU ALKALINE PHOSPHATASE SYNTHESIS SENSOR PROTEIN MOR (EC 2.7.3.-)	75	53	156
1268	1	271	137	gi1104135	[ornithine acetyltransferase] [Bacillus stearothermophilus] sp|Q07908|ARGJ_BACST GLUTAMATE N-ACETYLTRANSFERASE (EC 2.3.1.35) ORNITHINE ACETYLTRANSFERASE] [ORNITHINE TRANSACETYLASE] [ONATASE] / MINO-ACID ACETYLTRANSFERASE (EC 2.3.1.1) (N-ACETYLGLUTAMATE YNTIA	75	63	135
1500	1	324	163	gi11205488	[oxonucleoside ABC subunit B] [Haemophilus influenzae]	75	57	162
1529	1	798	400	gi11002521	[nucl] [Bacillus subtilis]	75	54	399
3010	1	770	387	gi11204435	[pyruvate formate-lyase activating enzyme] [Haemophilus influenzae]	75	54	384
3105	1	1	180	gi11041097	[pyruvate kinase] [Bacillus psychrophilus]	75	57	180
3117	1	45	212	gi1189317	[peptide synthetase module] [Microcystis aeruginosa] pir1S4911|S4911 probable amino acid activating domain - Microcystis aeruginosa (fragment) (SUB 144-528)	75	42	168
3139	2	139	345	gi1145294	[adenine phosphoribosyl-transferase] [Escherichia coli]	75	66	207
3880	1	618	310	gi11009366	[respiratory nitrate reductase] [Bacillus subtilis]	75	58	309
3911	1	48	401	gi11433991	[ATP synthase subunit beta] [Bacillus subtilis]	75	68	354
3957	1	2	379	gi1116889|B368	[3-isopropylmalate dehydratase (EC 4.2.1.3)] chain luuC - Lactococcus lactis subsp. lactis (strain IL1403)	75	65	378
4005	1	5	259	gi11216746	[D-lactate dehydrogenase] [Lactobacillus plantarum]	75	48	255
4080	1	73	333	gi11415855	[deoxyribose aldolase] [Mycoplasma hominis]	75	59	261

TABLE 2

S. aureus - putative coding regions of novel proteins similar to known proteins

Cu	ORF	Start	Stop	match	match	match	% sim	% ident	length
ID	ID	(nt)	(nt)	accession	gene name	(nt)			(nt)
411	1	1	339	gi149435	putative [Lactococcus lactis]		75	57	339
4136	1	602	303	gi1450688	hslM gene of Ecopri gene product [Escherichia coli] pIR/S3837/S38437 hsdM protein - Escherichia coli pIR/S09629/S09629 hypothetical protein A - Escherichia coli (SUB 40-520)		75	56	300
4146	1	658	336	gi148972	nitrate transporter [Synecococcus sp.]		75	49	333
4237	1	664	374	gi1339950	large subunit of NADH-dependent glutamate synthase (Plectonema boryanum)		75	55	291
4306	2	73	318	gi1294260	major surface glycoprotein [Pneumocystis carinii]		75	68	246
4343	1	715	359	gi1204652	methylated-DNA-protein-cysteine methyltransferase [Haemophilus influenzae]		75	52	357
4552	1	620	312	gi1396464	ATPase [Lactococcus lactis]		75	55	309
38	9	5776	6126	gi1443793	NupC [Escherichia coli]		74	50	351
50	8	6910	6221	gi1239988	hypothetical protein [Bacillus subtilis]		74	55	690
56	9	10770	12221	gi1000431	TrpP [Bacillus subtilis]		74	57	1452
64	2	2266	1622	gi141015	aspartate-tRNA ligase [Escherichia coli]		74	57	645
66	6	5063	4848	gi1212729	YqhJ [Bacillus subtilis]		74	47	216
67	18	14334	14897	gi1510631	endoglucanase [Mechanococcus jannaschii]		74	52	564
102	15	12561	13136	gi149429	putative [Lactococcus lactis]		74	67	576
102	16	13321	14419	gi149435	putative [Lactococcus lactis]		74	57	1299
108	4	4873	3902	gi139478	ATP binding protein of transport ATPases [Bacillus firmus] ir/S15486/S15486 ATP-binding protein - Bacillus firmus pIR26946/YATR_BACFI HYPOTHETICAL ATP-BINDING TRANSPORT PROTEIN.		74	59	972
116	5	8574	7093	gi1205430	dipeptide transport system permease protein [Haemophilus influenzae]		74	49	1482
120	7	4342	4803	gi146970	ribonucleoside triphosphate reductase [Escherichia coli] pIR/A47331/A47331 anaerobic ribonucleotide reductase - Escherichia coli		74	58	462
121	7	5961	6581	gi1107528	tetG start [Campylobacter coli]		74	51	621
128	3	2320	3531	gi1143318	phosphoglycerate kinase [Bacillus megaterium]		74	57	1212
130	7	5237	5791	gi1256653	DNA-binding protein [Bacillus subtilis]		74	60	555
136	3	6745	5150	gi1143076	histidine [Bacillus subtilis]		74	58	1596
145	2	664	1368	gi1407773	devA gene product [Anabaena sp.]		74	45	705
152	1	552	277	gi1377833	unknown [Bacillus subtilis]		74	54	276

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	saqh gene name	% sim	% ident	length (nt)
164	10	11064	11375	gi|540900	ORF3 gene product [Bacillus subtilis]	74	52	312
175	2	3109	2624	gi|642656	unknown [Rhizobium meliloti]	74	34	486
175	9	6064	5612	gi|854656	Na/H antiporter system ORF2 [Bacillus alcalophilus]	74	46	453
195	11	11346	10339	gi|1204430	hypothetical protein (SP-P25745) [Haemophilus influenzae]	74	55	1008
205	17	9619	9059	gi|1044979	ribosomal protein L6 [Bacillus subtilis]	74	64	561
216	7	5574	6710	gi|1146207	putative [Bacillus subtilis]	74	63	1137
241	3	4521	3334	gi|694121	malate thiokinase [Methylobacterium extorquens]	74	52	1188
246	6	3105	2799	gi|467374	single strand DNA binding protein [Bacillus subtilis]	74	64	507
249	4	6551	5313	gi|1524197	glycine betaine transporter OpuD [Bacillus subtilis]	74	55	1239
261	7	4389	4081	gi|809542	CbrB protein [Erwinia chrysanthemi]	74	42	309
278	6	5714	4665	gi|1204872	ATP-binding protein [Haemophilus influenzae]	74	54	1050
309	1	1220	666	gi|1205579	hypothetical protein (GB-U14001.302) [Haemophilus influenzae]	74	53	555
315	2	1473	862	gi|143398	guinol oxidase [Bacillus subtilis]	74	57	612
320	1	1	1065	gi|143389	glutaminase of carbamyl phosphate synthetase [Bacillus subtilis] pir|239845|239845 carbamyl-phosphate synthase glutamine-hydrolyzing (EC 6.3.5.5), pyrimidine-repressible, small hain - Bacillus subtilis	74	60	1065
340	2	382	1128	gi|534857	ATPase subunit a [Bacillus stearothermophilus]	74	56	747
405	2	1742	1311	gi|1303915	YehZ [Bacillus subtilis]	74	65	432
433	5	2503	3270	gi|473902	alpha-acetolactate synthase [Lactococcus lactis]	74	56	768
452	1	1	942	gi|413982	ipa-58r gene product [Bacillus subtilis]	74	52	942
461	1	3	1193	gi|558494	homoserine dehydrogenase [Bacillus subtilis]	74	51	1191
461	2	1174	1407	gi|40211	threonine synthase (thrC) (AA 1-352) [Bacillus subtilis] tr|A25364|A25364 threonine synthase (EC 4.2.99.2) - Bacillus btllis	74	56	234
462	2	402	734	gi|142520	thioredoxin [Bacillus subtilis]	74	62	333
478	1	574	320	gi|1499005	glycyl-tRNA synthetase [Methanococcus jannaschii]	74	52	255
501	2	739	1740	gi|217040	acid glycoprotein [Streptococcus pyogenes]	74	58	1002
551	2	4083	2791	gi|143040	glutamate-1-semialdehyde 2,1-aminotransferase [Bacillus subtilis] pir|B42728|B42728 glutamate-1-semialdehyde 2,1-aminomutase (EC 4.3.8) - Bacillus subtilis	74	51	1293

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
573	1	1	477	gi11006605	hypothetical protein (Synechocystis sp.)	74	45	477
596	2	1780	1298	gi11303853	YqoF (Bacillus subtilis)	74	55	483
618	2	2924	1758	gi11146237	21.4% of identity to trans-acting transcription factor of <i>Saccharomyces cerevisiae</i> ; 35% of identity to sucrose synthase of <i>Zea mays</i> ; putative (Bacillus subtilis)	74	55	1167
659	2	1269	1595	gi1072380	ORF1 (Lactococcus lactis)	74	62	327
724	1	373	188	gi1143374	phosphoribosyl glycine synthetase (PUR-D, gtc start codon) (Bacillus subtilis)	74	58	186
743	2	604	1209	gi1153833	ORF1; putative (Streptococcus parvaquius)	74	50	606
836	1	2	259	gi1143458	ORF V (Bacillus subtilis)	74	47	258
989	2	443	724	gi11303994	YqkM (Bacillus subtilis)	74	46	282
1106	1	1	492	gi1146970	lepid gene product (Staphylococcus epidermidis)	74	54	492
1135	2	373	528	gi1141348	lipa-24d gene product (Bacillus subtilis)	74	48	156
1234	1	817	412	gi11495245	lrcJ gene product (Erwinia chrysanthemi)	74	36	366
2586	1	2	238	gi11149701	labcC gene product (Clostridium perfringens)	74	62	237
2959	1	798	400	gi11405456	lactonase (Bacillus subtilis)	74	60	399
2962	1	650	363	gi11450686	l-phosphoglycerate kinase (Thermotoga maritima)	74	58	288
2983	1	3	191	gi11303893	YqkL (Bacillus subtilis)	74	56	189
3018	1	2	223	gi1143040	glutamate-1-semialdehyde 2,1-aminotransferase (Bacillus subtilis) pir[D42728][D42728 glutamate-1-semialdehyde 2,1-aminotransferase (EC 4.3.8) - Bacillus subtilis]	74	56	222
3038	1	510	256	pir[S52915][S529	nitrate reductase alpha chain - Bacillus subtilis (fragment)	74	57	255
3062	1	374	189	gi11107528	lctg start (Campylobacter coli)	74	51	186
4035	1	184	360	gi11022725	unknown (Staphylococcus haemolyticus)	74	64	177
4045	1	607	305	gi11510977	M. jennaschii predicted coding region MJO938 (Methanococcus jennaschii)	74	41	303
4283	1	471	304	gi11520844	orf4 (Bacillus subtilis)	74	58	168
4449	1	3	221	gi11580910	peptide-synthetase ORF1 (Bacillus subtilis)	74	54	219
4587	1	458	231	gi11170207	orf6 (Lactobacillus sakei)	74	59	228

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
4603	1	29	214	gi1146208	glutamate synthase large subunit (EC 2.6.1.53) [Escherichia coli] pif/A25617/A25617 glutamate synthase (NADPH) (EC 1.4.1.13) large chain - Escherichia coli	74	60	186
4670	1	166	184	gi11456135	YBBF [Bacillus subtilis]	74	61	183
5	10	7953	7162	gi1143727	putative [Bacillus subtilis]	73	42	792
11	2	2454	1372	gi1166338	dihydroorotate dehydrogenase [Agrobacterium tumefaciens]	73	55	1083
14	1	2024	1020	gi1143373	phosphoribosyl aminimidazole carboxy formyl ornyltransferase/inosine monophosphate cyclohydrolase (Pur-Hij) [Bacillus subtilis]	73	54	1005
23	5	5426	4635	gi11468939	meso-2,3-butanediol dehydrogenase (D-acetoin forming) [Klebsiella pneumoniae]	73	58	792
23	17	17379	16360	gi1297060	ornithine cyclodeaminase [Rhizobium meliloti]	73	37	1020
29	2	692	1273	gi1467442	stage V sporulation [Bacillus subtilis]	73	54	582
31	5	6467	4914	gi1414000	ipe-76d gene product [Bacillus subtilis]	73	55	1554
37	8	8658	7402	gi1429259	pept gene product [Bacillus subtilis]	73	59	1257
37	9	7738	7562	gi1168167	alpha-isopropylmalate isomerase (put.) putative [Rhizomucor ircinellolides]	73	52	177
38	7	3931	4896	gi1405885	yeW [Escherichia coli]	73	58	966
44	6	5041	4238	gi1580895	unknown [Bacillus subtilis]	73	53	804
44	11	7767	8306	gi142009	lncAB gene product [Escherichia coli]	73	50	540
45	3	2439	3080	gi11109685	ProW [Bacillus subtilis]	73	47	642
54	13	14036	13794	gi1413931	ipe-7d gene product [Bacillus subtilis]	73	61	243
59	4	1430	2248	gi1147923	threonine dehydratase 2 (EC 4.2.1.16) [Escherichia coli]	73	53	819
65	1	1458	730	gi1677944	AppF [Bacillus subtilis]	73	56	729
80	2	1375	860	gi1580932	murD gene product [Bacillus subtilis]	73	53	516
102	13	10124	11179	gi1580891	3-isopropylmalate dehydrogenase (AA 1 - 355) [Bacillus subtilis] pif/A25522/A25522 3-isopropylmalate dehydrogenase (EC 1.1.1.85) - acillus subtilis	73	55	1056
109	2	3493	2600	gi11510849	W. jannaschii predicted coding region MJ0775 [Methanococcus jannaschii]	73	40	894
120	6	4782	5756	gi1146970	ribonucleoside triphosphate reductase [Escherichia coli] pif/A47331/A47331 anaerobic ribonucleotide reductase - Escherichia coli	73	56	975
120	9	5726	6223	gi11204333	anaerobic ribonucleoside-triphosphate reductase [Haemophilus influenzae]	73	62	498

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
132	5	4151	4363	gi|871048	HPSH2 - heavy chain potential motor protein [Giardia intestinalis]	73	43	213
140	6	5952	4324	gi|634107	kdpB [Escherichia coli]	73	59	1629
142	6	7060	5939	gi|410125	rliU gene product [Bacillus subtilis]	73	57	1122
149	4	1866	1717	gi|460892	heparin binding protein-44, HBP-44 (mice, Peptide, 360 aa) pirJX0281JX0281 heparin-binding protein-44 precursor - mouse gi|220434 ORF [Mus musculus] (SUB 2-360)	73	53	150
158	3	1	1431	gi|882504	ORF_550 [Escherichia coli]	73	57	1431
174	6	5352	4525	gi|1146240	ketopentolate hydroxymethyltransferase [Bacillus subtilis]	73	55	828
175	8	5537	5178	gi|854657	Na/H antiporter system ORF3 [Bacillus alcalophilus]	73	56	360
186	5	6593	5493	gi|467477	unknown [Bacillus subtilis]	73	48	1101
249	6	6283	5729	gi|1524397	glycine betaine transporter Opus [Bacillus subtilis]	73	56	555
265	4	1873	2280	gi|39846	luc [Bacillus subtilis]	73	41	408
270	1	328	582	gi|780461	1220 kDa polypeptide (African swine fever virus)	73	53	255
278	4	4283	3618	gi|1208965	hypothetical 23.3 kD protein [Escherichia coli]	73	49	666
279	3	4984	3593	gi|1185288	isochorismate synthase [Bacillus subtilis]	73	58	1392
291	4	1207	1575	gi|1511440	glutamine--fructose-6-phosphate transaminase [Methanococcus jannaschii]	73	63	369
299	2	735	1166	gi|467437	unknown [Bacillus subtilis]	73	58	432
299	5	2050	3234	gi|467439	temperature sensitive cell division [Bacillus subtilis]	73	53	1185
334	1	1237	728	gi|536655	ORF YBR244W [Saccharomyces cerevisiae]	73	43	510
336	2	1827	1036	gi|790943	lucase amidolyase [Bacillus subtilis]	73	51	792
374	3	1389	1874	gi|1405451	YneJ [Bacillus subtilis]	73	55	486
433	4	1916	2554	gi|473902	alpha-acetolactate synthase [Lactococcus lactis]	73	54	639
509	2	1795	1028	gi|467483	unknown [Bacillus subtilis]	73	56	788
513	1	1709	918	gi|1146220	NAD+ dependent glycerol-3-phosphate dehydrogenase [Bacillus subtilis]	73	56	792
533	2	239	733	gi|1510605	hypothetical protein (SP:842297) [Methanococcus jannaschii]	73	44	495
546	2	1148	2815	gi|41748	hdm protein (AA 1-520) [Escherichia coli]	73	52	1668
549	1	762	382	gi|1314847	ClnA [Bacillus subtilis]	73	57	381
567	1	1346	675	gi|410137	ORFX13 [Bacillus subtilis]	73	58	672

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
716	2	654	1112	gi|1256623	exo-deoxyribonuclease [Bacillus subtilis]	73	56	459
772	1	3	677	gi|142010	Shows 70.2% similarity and 48.6% identity to the ENV protein of salmonella typhimurium [Aerobacter sp.]	73	57	675
774	1	3	209	gi|409286	barU [Bacillus subtilis]	73	52	207
782	1	1	402	gi|143320	[gap] gene products [Bacillus megaterium]	73	56	402
789	2	451	762	gi|1063246	low homology to P14 protein of Haemophilus influenzae and 14.2 kDa protein of Escherichia coli [Bacillus subtilis]	73	56	312
796	1	3	911	gi|453754	ABC transporter [Bacillus subtilis]	73	58	909
806	3	1209	949	gi|143786	cryptophanyl-tRNA synthetase (EC 6.1.1.2) [Bacillus subtilis] pir|J70481|YMS5 cryptophan-tRNA ligase (EC 6.1.1.2) - Bacillus subtilis	73	51	261
816	2	4839	3097	gi|41748	hadM protein (AA 1-520) [Escherichia coli]	73	52	1743
839	1	798	400	gi|886906	argininosuccinate synthetase [Streptomyces clavuligerus] pir|S57659|S57659 argininosuccinate synthetase (EC 6.3.4.5) - Streptomyces clavuligerus	73	59	399
857	1	3	290	gi|348052	acetoin utilization protein [Bacillus subtilis]	73	50	288
1008	1	790	398	gi|40100	rodC (tag3) polypeptide (AA 1-746) [Bacillus subtilis] ir|S06049|S06049 rodC protein - Bacillus subtilis p|P3485|TAGF_BACSU TECHOIC ACID BIOSYNTHESIS PROTEIN P.	73	41	393
1018	1	1	213	gi|529357	No definition line found (Caenorhabditis elegans) sp|P66975|STT3_CAEEL OLIGOSACCHARYL TRANSFERASE STT3 SUBUNIT OHLOG.	73	53	213
1031	1	3	491	gi|142706	comG1 gene product [Bacillus subtilis]	73	51	489
1174	1	395	204	gi|1149513	alpha subunit of laminin 5 [Homo sapiens]	73	60	192
1175	1	655	329	gi|473817	'ORF' [Escherichia coli]	73	57	327
1187	1	3	209	gi|580870	ipa-37d quxa gene product [Bacillus subtilis]	73	52	207
1206	1	72	245	gi|144816	formyltetrahydrofolate synthetase (FHFS) (ttg start codon) (EC 3.4.3) [Moorella thermoacetica]	73	43	174
1454	1	423	241	gi|1213253	unknown [Schistosoma japonicum]	73	53	183
1469	1	517	260	gi|1303787	YdeG [Bacillus subtilis]	73	55	258
1761	1	374	189	gi|19135	Mat26Aa gene product [Drosophila simulans]	73	34	186
1849	1	467	243	gi|162307	DNA topoisomerase II [Trypanosoma cruzi]	73	60	225
2055	1	2	400	gi|559381	P47K protein [Rhodococcus erythropolis]	73	34	399
2556	1	2	244	gi|145925	fecB [Escherichia coli]	73	62	243

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
2947	2	549	400	gi|1184680	polynucleotide phosphorylase [Bacillus subtilis]	73	51	150
2956	1	746	375	gi|43397	quinol oxidase [Bacillus subtilis]	73	58	372
3037	1	655	329	gi|113091	acetolactate synthase [Bacillus subtilis]	73	55	327
3115	1	385	194	gi|323866	overlapping out-of-phase protein [eggplant mosaic virus]	73	53	192
3603	2	700	527	gi|1439521	glutaryl-CoA dehydrogenase precursor [Mus musculus]	73	48	174
3743	1	798	400	gi|450688	hadM gene of Ecopri gene product [Escherichia coli] pir|S38437|S38437 hadM protein - Escherichia coli pir|S09629|S09629 hypothetical protein A - Escherichia coli (SUM 40-520)	73	54	399
3752	1	640	359	gi|1524193	unknown [Mycobacterium tuberculosis]	73	59	282
3852	1	2	181	gi|216746	D-lactate dehydrogenase [Lactobacillus plantarum]	73	68	180
3914	1	475	239	pir|S13490|S134	Hydroxymethylglutaryl-CoA synthase (EC 4.1.3.5) - Chicken (fragment)	73	53	237
3914	2	570	343	gi|528991	unknown [Bacillus subtilis]	73	30	228
4069	1	2	316	gi|40003	oxoglutarate dehydrogenase (NADP+) [Bacillus subtilis] p1p23129|O001_BACSU 2-OXOGLUTARATE DEHYDROGENASE E1 COMPONENT (EC 2.4.2) (ALPHA-KETOGLUTARATE DEHYDROGENASE)	73	55	315
4165	1	715	365	gi|1439521	glutaryl-CoA dehydrogenase precursor [Mus musculus]	73	48	351
4196	1	1	177	gi|809660	deoxyribose-phosphate aldolase [Bacillus subtilis] pir|S49455|S49455 deoxyribose-phosphate aldolase (EC 4.1.2.4) - acillus subtilis	73	60	177
4202	1	572	378	gi|528991	unknown [Bacillus subtilis]	73	34	192
4314	1	2	193	gi|436797	N-acyl-L-amino acid amidohydrolase [Bacillus stearothermophilus] ep|P37112|AMA_BACST N-ACYL-L-AMINO ACID AMIDOHYDROLASE (EC 5.1.14) (AMINOACYLASE)	73	47	192
4393	1	3	263	gi|216267	ORF2 [Bacillus megaterium]	73	47	261
35	2	903	1973	gi|1146196	phosphoglycerate dehydrogenase [Bacillus subtilis]	72	53	1071
38	22	19094	17877	lc|602031	similar to trimethylamine DH [Mycoplama capricolum] pir|S49950|S49950 probable trimethylamine dehydrogenase (EC 5.99.7) - Mycoplasma capricolum (ISGC3) (fragment)	72	54	1218
38	23	18134	19162	gi|413968	lipa-44d gene product [Bacillus subtilis]	72	54	1029
44	19	11895	12953	gi|516272	unknown [Bacillus subtilis]	72	49	1059
48	7	6240	7117	gi|43489	pyruvate synthase [Halobacterium halobium]	72	49	870
50	7	6563	5691	gi|1205399	proton glutamate symport protein [Haemophilus influenzae]	72	53	873

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
53	9	10521	9259	gi|1303956	YQJE (Bacillus subtilis)	72	52	1263
56	23	29549	29995	gi|1467471	unknown (Bacillus subtilis)	72	47	447
69	4	5298	4123	gi|1354775	pfoS/R (Treponema pallidum)	72	46	1176
69	5	4377	4982	gi|904198	hypothetical protein (Bacillus subtilis)	72	43	606
73	1	2	856	gi|142997	glycerol uptake facilitator (Bacillus subtilis)	72	59	855
98	13	9371	10258	gi|1467435	unknown (Bacillus subtilis)	72	50	888
127	1	1	1593	gi|1217144	alanine carrier protein (thermophilic bacterium PS)	72	56	1593
131	1	5197	2600	gi|153952	alanine transport protein - thermophilic acterium PS-3	72	53	2598
141	4	1040	1978	gi|1405446	polymerase III polymerase subunit (dnaE) (Salmonella typhimurium)	72	54	939
149	6	2819	2335	gi|1606234	pir|A45915|A45915 DNA-directed DNA polymerase (EC 2.7.7.7) III ipha chain - Salmonella typhimurium	72	44	285
149	17	5472	5245	gi|1304472	transketolase (Bacillus subtilis)	72	55	228
154	1	1	210	gi|1205620	secY (Escherichia coli)	72	40	210
155	1	2207	1320	gi|391610	DNA polymerase (unidentified phycodnavirus clone OTU4)	72	57	688
180	1	2	328	gi|1433630	ferritin like protein (Haemophilus influenzae)	72	62	327
184	3	1145	3553	gi|1205110	farnesyl diphosphate synthase (Bacillus stearothermophilus)	72	49	2409
195	2	1923	1279	gi|1001730	pir|JX0257|JX0257 geranyltransferase (EC 2.5.1.10) - Bacillus stearothermophilus	72	45	645
206	113	14646	15869	gi|1064807	tearothermophilus	72	50	1224
209	2	462	932	gi|1204666	ORFTHINE AMINOTRANSFERASE (Bacillus subtilis)	72	60	471
215	2	764	522	gi|1881513	hypothetical protein (GB:X73124.53) (Haemophilus influenzae)	72	63	243
224	1	2	790	gi|1949974	insulin receptor homolog (Drosophila melanogaster) pir|S57245|S57245 insulin receptor homolog - fruit fly (Drosophila melanogaster) (SUB 46-2146)	72	54	789
233	1	1526	765	gi|1408493	sucrose repressor (Staphylococcus xylosus)	72	52	762
240	1	220	1485	gi|537049	homologous to SwissProt:VIDA_ECOLI hypothetical protein (Bacillus subtilis)	72	52	1266
245	1	3	1340	gi|1204578	ORF_0470 (Escherichia coli)	72	46	1338
					hypothetical protein (GB:U06949.1) (Haemophilus influenzae)	72		

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
259	2	2108	1245	gi11340128	ORP1 [Staphylococcus aureus]	72	59	864
304	2	285	1094	gi11205130	glutamine-binding periplasmic protein [Haemophilus influenzae]	72	52	810
307	10	5326	5039	gi11070015	protein-dependent [Bacillus subtilis]	72	53	288
315	1	517	260	gi1141399	quinol oxidase [Bacillus subtilis]	72	55	258
316	11	9622	9308	gi11204445	hypothetical protein (SP.P27857) [Haemophilus influenzae]	72	56	315
337	3	926	1809	gi1487433	citrate synthase II [Bacillus subtilis]	72	55	684
364	7	12538	10493	gi11510643	ferrous iron transport protein B [Mechanococcus jannaschii]	72	53	2046
409	2	340	1263	gi11402944	forRM1 gene product [Bacillus subtilis]	72	49	924
441	3	2177	1590	gi1312379	highly conserved among subacteria [Clostridium acetobutylicum] pir15411154312 hypothetical protein V - Clostridium acetobutylicum	72	48	588
453	6	2654	2505	gi15006011	antibacterial protein 3 - Staphylococcus haemolyticus	72	70	150
460	1	2	625	gi11016162	ABC transporter subunit [Cyanophora paradoxa]	72	51	624
463	1	3253	1628	gi1666014	The polymorphism (R192) of this gene is associated with susceptibility to essential hypertension. The SA gene product has light homology to COA synthetase [Homo sapiens]	72	60	1626
480	4	3047	3466	gi1433992	ATP synthase subunit epsilon [Bacillus subtilis]	72	53	420
502	1	1086	586	gi1310859	ORP2 [Synecococcus sp.]	72	50	501
519	1	81	1184	gi1101704	YrX2 [Bacillus subtilis]	72	54	1104
559	1	3	746	gi1107530	cenD gene product [Campylobacter coli]	72	56	744
575	1	1142	573	gi1303866	Yqps [Bacillus subtilis]	72	56	570
671	1	2	592	gi1204497	protein-export membrane protein [Haemophilus influenzae]	72	44	591
679	2	295	1251	gi1563258	virulence-associated protein E [Dichelobacter nodosus]	72	52	957
687	2	295	957	gi1146214	44% identical amino acids with the Escherichia coli amba suprase; putative [Bacillus subtilis]	72	49	663
837	1	1	435	gi1146183	putative [Bacillus subtilis]	72	54	435
868	1	150	788	gi1377842	unknown [Bacillus subtilis]	72	55	639
922	1	130	432	gi11088269	unknown protein [Azotobacter vinelandii]	72	58	303
941	1	2	238	gi1153929	NADPH-sulfite reductase flavoprotein component [Salmonella yphimurium]	72	49	237
980	1	840	421	gi1853767	UDP-N-acetylglucosamine 1-carboxyvinyltransferase [Bacillus subtilis]	72	59	420

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
1209	1	383	213	gi1144735	neurotoxin type B [Clostridium botulinum]	72	44	171
1469	2	671	474	gi1205458	hypothetical protein (GB:D8562.47) [Haemophilus influenzae]	72	63	198
1956	1	727	365	gi1154409	hexosephosphate transport protein [Salmonella typhimurium] pir|B41853|B41853 hexose phosphate transport system regulatory protein uhpB - Salmonella typhimurium	72	44	363
2101	1	3	401	gi1303950	VqIV [Bacillus subtilis]	72	50	399
2503	1	569	399	gi1149713	formate dehydrogenase [Methanobacterium formicicum] pir|A42712|A42712 formate dehydrogenase (EC 1.2.1.2) - Methanobacterium formicicum	72	56	171
2967	1	3	155	gi1121229	VqkJ [Bacillus subtilis]	72	46	153
3004	1	367	185	gi11665999	hypothetical protein [Bacillus subtilis]	72	55	183
3109	1	278	141	gi1413968	ipa-41d gene product [Bacillus subtilis]	72	45	138
3171	1	3	287	gi1515938	glutamate synthase (ferredoxin) [Synecocystis sp.] pir|S44957|S44957 glutamate synthase (ferredoxin) (EC 1.4.7.1) - Synecocystis sp.	72	52	285
3771	1	26	367	gi11408501	homologous to N-acyl-L-amino acid amidohydrolase of Bacillus stearothermophilus [Bacillus subtilis]	72	63	342
3951	1	1	222	gi13500409	M. Jannaschil predicted coding region M1519 [Methanococcus jannaschii]	72	38	222
4190	1	721	362	gi139956	IGIC [Bacillus subtilis]	72	57	360
4444	1	3	347	gi11009366	Respiratory nitrate reductase [Bacillus subtilis]	72	55	345
6	2	911	1200	gi11537095	ornithine carbamoyltransferase [Escherichia coli]	71	56	270
11	15	11350	10859	gi11532309	25 kDa protein [Escherichia coli]	71	47	492
19	2	1248	2435	gi11244574	D-alanine-D-alanine ligase [Enterococcus hirae]	71	52	1188
21	2	898	1488	gi1149629	anthranilate synthase component 2 [Leptospira biflexa] pir|C32840|C32840 anthranilate synthase (EC 4.1.3.2) component II Leptospira biflexa	71	45	591
34	1	1	567	gi1303983	VqkF [Bacillus subtilis]	71	59	567
37	3	3192	2806	gi11209681	glutamate-rich protein [Bacillus firmus]	71	50	387
38	18	12250	12462	gi11927645	arginyl endopeptidase [Porphyromonas gingivalis]	71	50	213
39	3	1246	4431	pir|S09411|S094	spoIIIE protein - Bacillus subtilis	71	49	3186
53	14	15770	14760	gi1142611	branched chain alpha-keto acid dehydrogenase E1-alpha [Bacillus subtilis]	71	58	1011
54	11	13461	12623	gi1143014	lent repressor [Bacillus subtilis]	71	46	837

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
57	7	7152	5860	gi|508175	EIC domain of PTS-dependent Gat transport and phosphorylation <i>Escherichia coli</i>	71	48	1293
57	18	13897	14334	gi|1063247	high homology to flavohemoprotein (Hemoglobin-like protein) of <i>Alcaligenes eutrophus</i> and <i>Saccharomyces cerevisiae</i> [<i>Bacillus subtilis</i>]	71	56	438
62	16	9831	10955	gi|1303926	YqjG [<i>Bacillus subtilis</i>]	71	54	1125
70	12	8505	8966	gi|147198	lpnE protein [<i>Escherichia coli</i>]	71	38	462
86	5	2394	2089	gi|904205	hypothetical protein [<i>Bacillus subtilis</i>]	71	51	306
96	7	7601	8269	gi|709991	hypothetical protein [<i>Bacillus subtilis</i>]	71	49	669
100	6	4822	5931	gi|1060868	Opine dehydrogenase [<i>Arthrobacter</i> sp.]	71	45	1110
103	1	1062	532	gi|143089	lep protein [<i>Bacillus subtilis</i>]	71	41	531
109	18	15312	15695	gi|413985	lpa-61d gene product [<i>Bacillus subtilis</i>]	71	57	384
113	1	630	316	gi|663254	probable protein kinase [<i>Saccharomyces cerevisiae</i>]	71	57	315
114	5	6598	5603	gi|141156	membrane bound protein [<i>Bacillus subtilis</i>]	71	40	996
133	2	3087	1723	gi|1303913	YqjX [<i>Bacillus subtilis</i>]	71	53	1365
149	19	6335	5895	gi|529650	GAP [<i>Bacteriophage SP21</i>]	71	51	441
154	5	3635	3087	gi|425488	repressor protein [<i>Streptococcus sobrinus</i>]	71	47	549
164	11	11354	11699	gi|49318	ORF4 gene product [<i>Bacillus subtilis</i>]	71	52	336
169	5	1936	2745	gi|1403403	unknown [<i>Mycobacterium tuberculosis</i>]	71	56	810
193	2	272	1234	gi|1303788	YqjM [<i>Bacillus subtilis</i>]	71	49	963
205	1	1743	895	gi|1215694	GlnQ [<i>Mycoplasma pneumoniae</i>]	71	46	849
233	4	1849	2022	gi|633732	ORF1 [<i>Campylobacter jejuni</i>]	71	50	174
237	7	4501	5169	gi|149384	HistE [<i>Lactococcus lactis</i>]	71	54	669
272	4	2848	2273	gi|709993	hypothetical protein [<i>Bacillus subtilis</i>]	71	48	576
274	2	618	1496	gi|143015	NAD(P)H:glutamate-transfer RNA reductase [<i>Bacillus subtilis</i>] pir|A35252|A35252 5-aminolevulinic synthase (EC 2.3.1.37) - <i>acillus subtilis</i>	71	53	879
276	5	3349	2720	gi|303562	ORF210 [<i>Escherichia coli</i>]	71	50	630
287	1	136	660	gi|110634	20 kDa protein [<i>Streptococcus gordonii</i>]	71	53	525
288	6	3322	2771	gi|1256625	putative [<i>Bacillus subtilis</i>]	71	47	552

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
301	6	3492	2461	gi|467417	similar to lysine decarboxylase [Bacillus subtilis]	71	57	1032
306	4	6607	5222	gi|1256618	transport protein [Bacillus subtilis]	71	56	1386
307	2	1536	925	gi|632683	orfC [Mycoplasma capricolum]	71	45	612
310	5	5793	5146	gi|368052	acetoin utilisation protein [Bacillus subtilis]	71	51	648
322	1	2	1303	gi|1001819	hypothetical protein [Synecocystis sp.]	71	46	1302
331	4	4171	3995	gi|467473	unknown [Bacillus subtilis]	71	57	177
350	2	548	922	gi|551879	ORF 1 [Lactococcus lactis]	71	55	375
375	4	1860	3071	gi|467447	unknown [Bacillus subtilis]	71	57	1212
380	5	1560	2102	gi|142557	ATP synthase b subunit [Bacillus megaterium]	71	43	543
414	2	251	637	gi|580904	homologous to E. coli rnpA [Bacillus subtilis]	71	49	387
424	1	335	1354	gi|581305	L-lactate dehydrogenase [Lactobacillus plantarum]	71	57	1020
436	4	3701	3270	pir|P0501|P005	phosphoribosylanthranilate isomerase (EC 5.3.1.24) - Bacillus subtilis (fragment)	71	66	432
482	1	3	1280	gi|410142	ORFX18 [Bacillus subtilis]	71	49	1278
525	3	2272	1844	gi|143370	phosphoribosylpyrophosphate amidotransferase (Pur-P; EC 2.4.2.14) Bacillus subtilis	71	56	429
529	4	2739	2847	gi|606150	ORF_1309 [Escherichia coli]	71	43	693
563	1	22	969	gi|1237015	ORF4 [Bacillus subtilis]	71	53	948
581	1	506	255	gi|1301730	W25G3.2 [Caenorhabditis elegans]	71	47	232
612	2	1068	913	gi|153968	flambrase 2 [Salmonella typhimurium]	71	55	156
613	1	1	634	gi|466778	lysine specific permease [Escherichia coli]	71	50	654
618	1	1243	623	gi|1146238	poly(A) polymerase [Bacillus subtilis]	71	52	621
630	1	1170	586	gi|1486243	unknown [Bacillus subtilis]	71	53	585
691	1	1126	641	gi|289260	comE ORF1 [Bacillus subtilis]	71	51	486
694	2	149	427	gi|12971	NADH dehydrogenase subunit V (aa 1-605) [Gallus gallus] ir|S10197|S10197 NADH dehydrogenase (ubiquinone) (EC 1.6.5.3) chain - chicken mitochondrion (SQC1)	71	47	279
715	2	169	777	gi|1303830	YqfL [Bacillus subtilis]	71	53	609
746	2	1473	970	gi|1377843	unknown [Bacillus subtilis]	71	52	504

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
748	1	1437	802	gi1405459	YnaS [Bacillus subtilis]	71	49	636
753	1	1018	524	gi1510389	M. jannaschii predicted coding region M20296 [Methanococcus jannaschii]	71	53	495
761	1	3	215	gi1475972	pentafunctional enzyme [Pneumocystis carinii]	71	47	213
783	1	1203	703	gi1536655	ORF YBR244w [Saccharomyces cerevisiae]	71	52	501
800	3	1292	987	gi1204326	tRNA delta(2)-isopentenylpyrophosphate transferase [Haemophilus influenzae]	71	48	306
806	1	116	286	gi1419075	chiW gene product [Methanobacterium thermoautotrophicum]	71	50	171
931	1	973	488	gi1893358	PgsA [Bacillus subtilis]	71	56	486
1041	1	2	262	gi11408507	pyrimidine nucleoside transport protein [Bacillus subtilis]	71	45	261
1070	1	2	172	gi1709993	hypothetical protein [Bacillus subtilis]	71	46	171
1176	1	57	365	gi151259	HMG-CoA reductase (EC 1.1.1.88) [Pseudomonas mavalonii] pir[A44756]A44756 hydromethylglutaryl-CoA reductase (EC 1.1.1.88) Pseudomonas sp.	71	49	309
1181	1	366	184	gi146971	epiP gene product [Staphylococcus epidermidis]	71	50	183
1281	1	3	290	gi1353016	ORF 419 protein [Staphylococcus aureus]	71	50	288
1348	1	456	229	gi1602683	orfC [Mycoplasma capricolum]	71	48	228
2002	1	756	379	gi1008177	ORF YJL046w [Saccharomyces cerevisiae]	71	48	378
2119	1	2	217	gi1046088	arginyl-tRNA synthetase [Mycoplasma genitalium]	71	50	216
2418	1	3	320	gi11499771	M. jannaschii predicted coding region M20936 [Methanococcus jannaschii]	71	57	318
2961	1	2	187	gi1312443	carbamoyl-phosphate synthase (glutamine-hydrolysing) [Bacillus aldolyticus]	71	57	186
2999	2	67	306	gi1710020	nitrite reductase (nirB) [Bacillus subtilis]	71	43	240
3033	1	2	184	gi13262335	YnaA [Bacillus subtilis]	71	57	183
3584	1	3	338	gi1401716	beta-isopropylmalate dehydrogenase [Neurospora crassa]	71	55	336
3715	2	743	399	gi1563952	glucanase perase [Bacillus licheniformis]	71	59	345
3785	1	770	387	gi147382	acyl-CoA-dehydrogenase [Streptomyces purpurascens]	71	57	384
3875	1	541	272	gi1001541	hypothetical protein [Synchocystis sp.]	71	38	270
4135	1	637	320	gi142695	S-adenosyl-L-methionine:uroporphyrinogen III methyltransferase [Bacillus megaterium]	71	52	318
4249	1	63	239	gi1205363	deoxyribose aldolase [Haemophilus influenzae]	71	63	177
4508	1	530	267	gi1197667	vitellogenin [Anolis pulchellus]	71	46	264

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
6	3	1237	2721	gi11221788	larginine ornithine antiporter [Clostridium perfringens]	70	54	1485
11	11	6572	7486	gi1216854	p47k [Pseudomonas chlororaphis]	70	41	915
12	1	2890	1481	gi1467330	replicative DNA helicase [Bacillus subtilis]	70	49	1410
15	1	1756	893	gi1451216	Mannosephosphate isomerase [Streptococcus mutans]	70	46	864
15	2	1277	1050	gi1476092	unknown [Bacillus subtilis]	70	50	228
17	2	2132	1350	gi1145402	choleline dehydrogenase [Escherichia coli]	70	52	783
21	1	2	925	gi1149516	anthranilate synthase alpha subunit [Lactococcus lactis] p1r|S35124|S35124 anthranilate synthase (EC 4.1.3.27) alpha chain - actococcus lactis subsp. lactis	70	50	924
25	7	5580	6251	gi11389549	ORF3 [Bacillus subtilis]	70	52	672
33	6	6071	7423	gi11303875	Yqha [Bacillus subtilis]	70	51	1353
36	2	959	1594	gi1500755	methy purine glycoylase [Mus musculus]	70	47	636
38	8	4901	5860	gi11408507	pyrimidine nucleoside transport protein [Bacillus subtilis]	70	44	960
44	8	5312	5989	gi11006620	hypothetical protein [Synecocystis sp.]	70	49	678
46	10	8950	10020	gi11403126	lcsd gene product [Alcaligenes eutrophus]	70	45	1071
52	2	2727	1900	gi11486247	unknown [Bacillus subtilis]	70	53	828
52	6	4048	4656	gi1244501	esterase II-carboxylesterase (EC 3.1.1.1) [Pseudomonas fluorescens, eptido, 218 aa]	70	50	609
56	8	8460	9962	gi11339951	small subunit of NADH-dependent glutamate synthase [Plectonema boryanum]	70	51	1503
62	1	48	290	gi1142702	A competence protein 2 [Bacillus subtilis]	70	47	243
64	1	1080	541	gi11204377	molybdopterin biosynthesis protein [Haemophilus influenzae]	70	47	540
70	5	5139	3595	gi11204834	2',3'-cyclic-nucleotide 2'-phosphodiesterase [Haemophilus influenzae]	70	47	1545
91	4	7793	5466	gi11886471	methionine synthase [Catharanthus roseus]	70	56	2328
96	5	8754	7255	pir|B39096|B390	alkaline phosphatase (EC 3.1.3.1) III precursor - Bacillus subtilis	70	54	1500
110	2	767	1300	gi1145294	adenine phosphoribosyl-transferase [Escherichia coli]	70	51	534
116	6	7026	7976	gi1143607	sporulation protein [Bacillus subtilis]	70	50	931
121	8	6401	6988	gi11107528	ctg start (Campylobacter coli)	70	45	588
131	8	6842	7936	gi11150454	proliferase PcpO [Lactobacillus delbrueckii]	70	48	1095

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
135	1	2	1489	gi|311109	putative membrane-bound protein with four times repetition of ro-Sar-Ale at the N-terminus; function unknown [Alcaligenes utrophus]	70	49	1488
138	3	418	714	gi|504181	hypothetical protein [Bacillus subtilis]	70	46	297
164	8	9344	9874	gi|49315	ORF1 gene product [Bacillus subtilis]	70	47	531
164	16	15626	16618	gi|1205212	hypothetical protein (GB:D10483_18) [Haemophilus influenzae]	70	50	993
205	2	2735	1803	gi|1215695	peptide transport system protein SapF homolog; SapF homolog [Mycoplasma pneumoniae]	70	47	933
209	3	910	1386	gi|1204665	hypothetical protein (GB:X73124.26) [Haemophilus influenzae]	70	48	477
246	3	340	756	gi|1215098	lexisonease [Bacteriophage 154e]	70	46	417
263	7	7876	6749	gi|142540	aspartokinase II [Bacillus sp.]	70	51	1128
268	3	3212	4117	gi|1340128	ORF1 [Staphylococcus aureus]	70	50	906
302	6	3201	3827	gi|147782	ruvA protein (gtg start) [Escherichia coli]	70	46	627
302	10	5879	7051	gi|138530|C185	queuine tRNA-ribosyltransferase (SC 2.4.2.29) - Escherichia coli	70	55	1173
313	1	2520	1414	gi|1205934	aminopeptidase a/1 [Haemophilus influenzae]	70	46	1107
355	2	379	689	gi|1070013	protein-dependent [Bacillus subtilis]	70	48	291
403	1	1255	629	gi|733147	GumF [Xanthomonas campestris]	70	33	627
444	10	8770	9273	gi|1204752	high affinity ribose transport protein [Haemophilus influenzae]	70	52	504
449	1	2	1243	gi|619724	HgtE [Bacillus firmus]	70	44	1242
472	1	637	320	gi|727145	open reading frame; putative [Bacillus mytiloliquefaciens] pir[B25091|B25091|B25091] - Bacillus mytiloliquefaciens (fragment)	70	41	318
480	2	727	1608	gi|142560	ATP synthase gamma subunit [Bacillus megaterium]	70	44	882
524	1	2	307	gi|602292	RCH2 protein [Brassica napus]	70	45	306
525	1	823	413	gi|143372	phosphoribosyl glycineamide formyltransferase (PGR-N) [Bacillus subtilis]	70	52	411
565	4	3625	2552	gi|881434	ORFP [Bacillus subtilis]	70	51	1074
607	4	829	1284	gi|511524	hypothetical protein (SP:P17002) [Methanococcus jannaschii]	70	50	456
633	1	3383	703	gi|431231	luciferase [Bacillus caldolyticus]	70	53	681
646	3	1683	1309	gi|467340	unknown [Bacillus subtilis]	70	49	375
663	1	830	417	gi|1303873	Y-92 [Bacillus subtilis]	70	40	414

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
681	1	1488	781	gi1001678	hypothetical protein [Synecocystis sp.]	70	53	708
708	1	2	448	sp|P33940|YOHK_	HYPOHETICAL 54.3 KD PROTEIN IN ECO-ALKB INTERGENIC REGION.	70	51	447
725	1	51	722	gi1001644	hypothetical protein [Synecocystis sp.]	70	48	672
776	1	1371	787	gi1145185	putative [Escherichia coli]	70	47	585
834	1	250	783	gi1552971	NADH dehydrogenase (ndhF) [Vicia faba]	70	47	534
865	2	1585	1379	gi11204636	ATP-dependent helicase [Haemophilus influenzae]	70	45	207
894	1	535	269	gi1467364	DNA binding protein (proble) [Bacillus subtilis]	70	41	267
919	1	3	317	gi1314847	ClnA [Bacillus subtilis]	70	40	315
944	1	3	572	gi1705991	hypothetical protein [Bacillus subtilis]	70	44	570
988	2	772	605	gi1142441	ORF 3: putative [Bacillus subtilis]	70	50	168
1055	1	3	335	gi1529755	IspeC [Streptococcus pyogenes]	70	37	333
1093	1	2	904	gi1853754	ABC transporter [Bacillus subtilis]	70	49	903
1109	1	2	310	gi1001827	hypothetical protein [Synecocystis sp.]	70	42	309
1220	1	468	235	sp|S23416|S234	epiB protein - Staphylococcus epidermidis	70	40	234
1279	1	73	348	gi1153015	FemA protein [Staphylococcus aureus]	70	47	276
1336	1	195	542	sp|P31776|PBPB_	PENICILLIN-BINDING PROTEIN 1A (PBP-1A) [PENICILLIN-BINDING PROTEIN A]	70	50	348
1537	2	232	402	gi11146181	putative [Bacillus subtilis]	70	50	171
1574	1	451	272	gi1219630	endothelin-A receptor [Homo sapiens]	70	47	180
1640	1	690	346	gi11146243	22.4% identity with Escherichia coli DNA-damage inducible protein ...; putative [Bacillus subtilis]	70	46	345
2504	1	2	286	gi1495179	transmembrane protein [Lactococcus lactis]	70	51	285
3061	1	564	301	gi1508175	E11C domain of PTS-dependent Gat transport and phosphorylation Escherichia coli	70	44	264
3128	1	2	199	gi11340096	unknown [Mycobacterium tuberculosis]	70	51	198
3218	1	3	488	gi1515938	glutamate synthase (ferredoxin) [Synecocystis sp.] pir|S46957|S46957 glutamate synthase (ferredoxin) [EC 1.4.7.1] - ynechocystis sp.	70	50	486
3323	1	794	399	gi11154891	ATP binding protein [Phormidium laminosum]	70	52	396
3679	1	599	399	gi1529385	chromosome condensation protein [Caenorhabditis elegans]	70	30	201

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
3841	1	706	398	gi|1208965	hypothetical 23.3 kd protein [Escherichia coli]	70	47	309
3929	1	3	401	gi|149435	putative [Lactococcus lactis]	70	49	399
4044	1	595	374	gi|602031	similar to trimethylamine DII [Mycoplasma capricolum] pirlS49950 [S49950 probable trimethylamine dehydrogenase (EC 5.99.7) - Mycoplasma capricolum (SCC3) (fragment)]	70	40	222
4329	1	558	280	gi|1339951	small subunit of NADH-dependent glutamate synthase [Plectonema boryanum]	70	49	279
4422	1	576	289	gi|294464	ATPase [Lactococcus lactis]	70	57	288
4647	1	361	200	gi|166412	NADH-glutamate synthase [Medicago sativa]	70	59	162
16	8	7571	9031	gi|1499620	M. jennaschii predicted coding region M30798 [Methanococcus jannaschii]	69	44	1461
16	9	9080	110033	gi|1353197	thioredoxin reductase [Eubacterium acidaminophilum]	69	54	934
30	1	1452	727	gi|1204910	hypothetical protein (GB:U14003.302) [Haemophilus influenzae]	69	52	726
38	4	1023	1298	gi|407773	devA gene product [Anabaena sp.]	69	41	276
44	9	5987	6595	gi|1205920	molybdate uptake system hydrophilic membrane-bound protein [Haemophilus influenzae]	69	45	609
62	15	9104	9475	gi|385178	unknown [Bacillus subtilis]	69	44	372
66	4	2402	2803	gi|1303893	YqjL [Bacillus subtilis]	69	51	402
67	15	14124	13627	gi|149647	ORF2 [Listeria monocytogenes]	69	37	498
67	17	14053	14382	gi|305002	ORF_2356 [Escherichia coli]	69	49	330
67	19	15130	15807	gi|1109684	ProV [Bacillus subtilis]	69	45	678
78	3	1447	2124	gi|1256633	putative [Bacillus subtilis]	69	53	678
78	4	4513	3725	gi|1103958	YojG [Bacillus subtilis]	69	32	789
85	4	4521	4213	pir|E29326|E293	hypothetical protein (pur operon) - Bacillus subtilis	69	32	309
86	6	3253	2654	gi|77332	orfC [Bacillus subtilis]	69	50	600
95	1	96	710	gi|766468	[4AII antigen, sperm tail membrane antigen-putative sucrose-specific phosphotransferase enzyme II homolog (nlce, testis, Peptide Partial, 72 aa)]	69	43	615
100	7	6023	7426	gi|1205355	Na+/H+ antiporter [Haemophilus influenzae]	69	39	1404
102	2	2678	1650	gi|561690	isoleucylprotease [Pasteurella haemolytica]	69	47	1029
103	8	12241	8537	gi|1009166	Respiratory nitrate reductase [Bacillus subtilis]	69	54	3705
103	11	14987	12552	gi|710020	nitrite reductase (nirB) [Bacillus subtilis]	69	51	2436

TABLE 2

S. aureus - putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
112	11	8708	10160	gi|154111	hexosephosphate transport protein [Salmonella typhimurium] pir[D185] [D185] hexose phosphate transport system protein uhpF - salmonella typhimurium	69	51	1461
112	16	16644	17414	gi|1204435	pyruvate formate-lyase activating enzyme [Haemophilus influenzae]	69	50	771
113	2	33	953	gi|290509	o307 [Escherichia coli]	69	43	921
114	2	1537	1058	pir[A4271]A427	reticulocyte-binding protein 1 - Plasmodium vivax	69	39	480
121	6	4309	5310	gi|154633	NrdF [Bacillus subtilis]	69	53	1002
125	2	267	854	gi|413931	lpa-7d gene product [Bacillus subtilis]	69	43	588
149	27	10666	10400	pir[S24089]S280	hypothetical protein A - yeast (Zygosaccharomyces bisporus) plesaid pSB	69	39	267
161	1	1598	813	gi|1205538	hypothetical protein (GB:U14003_302) [Haemophilus influenzae]	69	47	786
165	4	2222	4633	gi|40054	[phenylalanyl-tRNA synthetase beta subunit (AA 1-804) [Bacillus subtilis]	69	52	2412
169	3	1210	1761	gi|296031	elongation factor Ts [Spirulina platensis]	69	45	552
175	12	8686	8339	gi|732682	FimE protein [Escherichia coli]	69	69	348
190	2	484	1671	sp|P1731|HIS8_	[HISTIDINOL-PHOSPHATE AMINOTRANSFERASE (EC 2.6.1.9) (IMIDAZOLE ACETOL-PHOSPHATE TRANSAMINASE)]	69	48	1188
206	1	5551	2777	gi|41750	hcdR protein (AA 1-1033) [Escherichia coli]	69	49	2775
206	4	6038	5796	gi|1256135	YbrF [Bacillus subtilis]	69	46	243
249	1	636	319	gi|1405456	YncP [Bacillus subtilis]	69	50	118
302	0	4820	5776	gi|1001768	hypothetical protein [Synecocystis sp.]	69	48	957
324	2	7384	3893	gi|1256798	pyruvate carboxylase [Rhizobium etli]	69	53	3492
351	3	2098	1808	gi|1491664	T04H1.4 [Caenorhabditis elegans]	69	30	291
369	3	2075	2305	gi|336458	ORF [Salmonella enterica serovar typhimurium]	69	61	231
392	3	1999	2424	gi|556015	ORF1 [Bacillus subtilis]	69	45	426
410	1	87	779	gi|155611	phosphoglyceromutase [Zymomonas mobilis]	69	58	693
421	1	3085	1129	gi|1276985	arginase [Bacillus caldovelox]	69	54	957
444	8	6713	7741	gi|1221782	purine synthesis repressor [Haemophilus influenzae]	69	40	1029
453	1	828	415	gi|122758	unknown [Bacillus subtilis]	69	57	414
469	2	3286	2246	gi|1458228	ImuY homolog [Homo sapiens]	69	44	1041

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
509	3	1710	1371	[gi|49224	[ORF 4 [Synecococcus sp.]	69	39	360
520	5	3023	2823	[gi|726427	similar to D. melanogaster MST101-2 protein (DPR-S34154) Caenorhabditis elegans]	69	39	201
531	1	26	760	[gi|509672	repressor protein [Bacteriophage Tuc2009]	69	33	735
589	1	107	253	[gi|169101	17.9 kDa heat shock protein (hsp17.9) [Pisum sativum]	69	52	147
594	2	597	1191	[gi|142783	DNA photolyase [Bacillus firmus]	69	48	795
604	4	2476	2114	[gi|413930	[ipa-6d gene product [Bacillus subtilis]	69	45	363
607	1	2	313	[gi|1236103	[W08D2.3 [Caenorhabditis elegans]	69	47	312
607	2	590	312	[gi|536715	[ORF YBR775c [Saccharomyces cerevisiae]	69	39	279
734	1	864	433	[gi|467327	unknown [Bacillus subtilis]	69	44	432
759	1	3	338	[gi|1009367	Respiratory nitrate reductase [Bacillus subtilis]	69	50	336
761	2	392	586	[gi|3508	Leucyl-tRNA synthetase (cytoplasmic) [Saccharomyces cerevisiae] [1370340	69	46	195
802	1	72	1013	[gi|143044	[ORF YPL140w [Saccharomyces cerevisiae]	69	55	942
816	1	2573	1368	[gi|1510268	[restriction modification system S subunit [Methanococcus jannaschii]	69	45	1206
838	2	133	387	[gi|1255371	coded for by C. elegans CDA YK349.5, coded for by C. elegans CDA YK349.3; Similar to guanilate kinase [Caenorhabditis elegans]	69	46	255
851	2	745	1005	[gi|288998	[secA gene product [Antilimonon sp.]	69	39	261
867	1	535	269	[gi|1070014	[protein-dependent [Bacillus subtilis]	69	47	267
935	1	954	478	[gi|1205569	[transcription elongation factor [Haemophilus influenzae]	69	53	477
999	1	1009	506	[gi|899254	[predicted trithorax protein [Drosophila virilis]	69	21	504
1127	1	1315	659	[gi|1205434	[H. influenzae predicted coding region W1191 [Haemophilus influenzae]	69	56	657
1138	1	248	460	[gi|1510646	[M. jannaschii predicted coding region M0568 [Methanococcus jannaschii]	69	48	213
1228	1	3	401	[gi|290503	[glutamate permease [Escherichia coli]	69	41	399
13090	1	444	223	[gi|1204987	[DNA polymerase III, alpha chain [Haemophilus influenzae]	69	36	222
13817	1	2	600	[gi|1483199	[peptide-synthetase [Mycobacterium mediterranei]	69	45	399
13833	1	667	335	[gi|1524193	unknown [Mycobacterium tuberculosis]	69	46	333

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
4079	1	747	400	gi|546918	orf3' of coxk [Bacillus subtilis, 826, Peptide Partial, 140 aa] pit[S43612]S43612 hypothetical protein Y - Bacillus subtilis sp|P40398|YHAD_BACSU HYPOTHETICAL PROTEIN IN COXK 3'-REGION (ORFY FRAGMENT)	69	64	348
4115	2	215	400	gi|517205	87 kDa Myosin-crossreactive streptococcal antigen [Streptococcus yogenes]	69	59	186
4139	1	1	333	gi|1208451	hypothetical protein [Synecocystis sp.]	69	36	333
4258	1	457	230	gi|496158	restriction-modification enzyme subunit M1 [Mycoplasma pulmonis] pit[S49395]S49395 HadM1 protein - Mycoplasma pulmonis (SDC3)	69	43	228
4317	1	90	374	gi|413967	lpa-43d gene product [Bacillus subtilis]	69	44	285
4465	1	3	293	gi|396296	similar to phosphotransferase system enzyme II [Escherichia coli] sp|P32672|PTMC_ECOLI PTS SYSTEM, FRUCTOSE-LIKE-2 IIC COMPONENT PHOSPHOTRANSFERASE ENZYME II, C COMPONENT)	69	49	291
3	1	2302	1193	gi|1109685	ProW [Bacillus subtilis]	68	46	1110
15	4	2592	2076	gi|807973	unknown [Saccharomyces cerevisiae]	68	45	519
31	8	6328	8772	gi|290642	ATPase [Enterococcus hirae]	68	48	2445
40	2	1115	750	gi|606342	ORF_0622; reading frame open far upstream of start; possible rameshift. linking to previous ORF [Escherichia coli]	68	55	166
46	9	6886	8415	gi|155276	aldehyde dehydrogenase [Vibrio cholerae]	68	44	1530
48	3	3643	3404	gi|285608	241k polyprotein [Apple stem grooving virus]	68	47	240
48	4	3536	4132	gi|1045937	M. genitalium predicted coding region M0246 [Mycoplasma genitalium]	68	39	597
53	10	11671	10685	gi|1303952	YqjA [Bacillus subtilis]	68	46	987
70	9	7346	8155	gi|147198	phnE protein [Escherichia coli]	68	40	810
89	4	1899	2966	gi|145173	35 kDa protein [Escherichia coli]	68	43	1068
108	1	2187	1150	gi|38722	precursor (aa -20 to 381) [Acinetobacter calcoaceticus] tr|A29277|A29277 aldose 1-epimerase (EC 5.1.3.3) - Acinetobacter calcoaceticus	68	57	1038
112	5	2666	3622	gi|153724	MalC [Streptococcus pneumoniae]	68	55	957
116	7	7865	8638	gi|143608	sporulation protein [Bacillus subtilis]	68	48	774
118	3	2484	3698	gi|1303805	YqeR [Bacillus subtilis]	68	46	1215
120	2	1424	1594	sp|P38038|CYSJ_	SULFITE REDUCTASE (NADPH) FLAVOPROTEIN ALPHA-COMPONENT (EC 1.8.1.2) (SIR-PP)	68	45	171
129	1	1	1011	gi|396307	argininosuccinate lyase [Escherichia coli]	68	50	1011

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
132	3	1867	2739	gi|116267	ORF2 [Bacillus megaterium]	68	48	873
134	2	848	1012	gi|1147545	DNA recombinase [Escherichia coli]	68	50	165
141	2	372	614	gi|872116	acti (stress inducible protein) [Glycine max]	68	36	243
149	7	2454	2260	gi|1145774	hap70 protein (dnaK gene) [Escherichia coli]	68	48	195
155	2	1776	1534	gi|216583	ORF1 [Escherichia coli]	68	36	243
158	3	1826	3289	sp|P33940|YQJH_	HYPOTHETICAL 34.3 KD PROTEIN IN ECO-ALKB INTERGENIC REGION.	68	51	1464
169	6	2749	3318	gi|11401402	unknown [Mycobacterium tuberculosis]	68	46	570
175	10	9158	7365	gi|1072395	phaA gene product [Rhizobium meliloti]	68	51	1794
186	7	4184	5434	gi|1173843	3-ketocyl-ACP synthase II [Vibrio Harveyi]	68	48	1251
189	3	907	1665	gi|467383	DNA binding protein (probable) [Bacillus subtilis]	68	55	759
206	5	7683	6709	gi|1236138	YbbI [Bacillus subtilis]	68	48	975
206	8	10425	12176	gi|452687	pyruvate decarboxylase [Saccharomyces cerevisiae]	68	48	1752
212	8	3421	3648	gi|1369941	cl gene product [Bacteriophage B1]	68	39	228
214	8	5457	6482	gi|1420467	ORF YOR196c [Saccharomyces cerevisiae]	68	45	1026
237	4	2507	3088	gi|149381	Hish [Lactococcus lactis]	68	46	582
243	5	5540	4542	gi|1235684	mevalonate pyrophosphate decarboxylase [Saccharomyces cerevisiae]	68	47	999
262	1	3	164	gi|150974	4-oxalocrotonate tautomerase [Pseudomonas putida]	68	42	162
262	2	1984	1118	gi|1147744	PER [Enterococcus hirae]	68	49	867
276	6	3702	3139	sp|p30750|ABC_E	ATP-BINDING PROTEIN ABC (FRAGMENT).	68	50	564
306	6	6345	5725	gi|1236617	adenine phosphoribosyltransferase [Bacillus subtilis]	68	53	621
333	3	4599	3850	gi|467473	unknown [Bacillus subtilis]	68	45	750
365	6	5017	4838	gi|1130643	T2283.3 [Caenorhabditis elegans]	68	45	180
376	2	549	1646	gi|1277026	DAPA aminotransferase [Bacillus subtilis]	68	51	1098
405	1	1741	872	gi|1303917	YglB [Bacillus subtilis]	68	47	870
406	2	853	539	gi|1511513	ABC transporter, probable ATP-binding subunit [Methanococcus jannaschii]	68	44	315
426	6	3558	3391	gi|624632	GltL [Escherichia coli]	68	48	168
438	1	108	329	gi|146923	nitrogenase reductase [Escherichia coli]	68	43	222

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
443	1	476	240	gi|535810	hippuricase [Campylobacter jejuni]	68	42	237
443	2	518	1015	gi|1204742	H. influenzae predicted coding region H10491 [Haemophilus influenzae]	68	48	498
443	5	4447	3779	gi|896660	deoxyribose-phosphate aldolase [Bacillus subtilis] pfr|S49455|S49455 deoxyribose-phosphate aldolase (EC 4.1.2.4) - acillus subtilis	68	55	669
476	2	240	1184	gi|571345	unknown, similar to E. coli cardiolipin synthase [Bacillus subtilis] sp|P45860|YME_BACSU HYPOTHETICAL 58.2 PROTEIN IN NARI-ACDA INTERGENIC REGION.	68	45	945
486	2	1876	1046	gi|147328	transport protein [Escherichia coli]	68	41	831
517	3	1764	2084	gi|523809	orf2 [Bacteriophage A2]	68	64	321
572	1	2	571	sp|P39237|V05L	HYPOTHETICAL 6.8 KD PROTEIN IN NRDC-TK INTERGENIC REGION.	68	47	570
646	1	914	459	gi|413982	ipe-58r gene product [Bacillus subtilis]	68	52	456
659	3	1668	1901	gi|1107541	C33D9.8 [Caenorhabditis elegans]	68	36	234
864	5	1510	1716	gi|145774	hap70 protein (dhak gene) [Escherichia coli]	68	48	207
920	1	860	432	gi|1510416	hypothetical protein (SP:P31666) [Methanococcus jannaschii]	68	54	429
952	1	1096	611	gi|C33456	reductase [Leishmania major]	68	46	486
970	1	91	402	gi|1354775	pfos/R [Treponema pallidum]	68	46	312
1028	1	1064	534	gi|510117	diaminopimelate decarboxylase [Bacillus subtilis]	68	47	531
1029	1	428	216	gi|1135714	Plasmidium falciptarum mRNA for asparagine-rich antigen (clone 17C1) [Plasmidium falciptarum]	68	31	213
1058	1	692	348	gi|581649	epic gene product [Staphylococcus epidermidis]	68	46	345
1096	2	665	465	gi|143434	Rho factor [Bacillus subtilis]	68	43	201
1308	1	2	694	gi|1169939	group B oligopeptidase, PepB [Streptococcus agalactiae]	68	50	693
1679	1	2	238	gi|117205	67 kDa Myosin-crossreactive streptococcal antigen [Streptococcus yogenes]	68	53	237
2039	1	3	383	gi|153898	transport protein [Salmonella typhimurium]	68	51	381
2077	1	3	326	pf|C33496|C334	hisC homolog - Bacillus subtilis	68	47	324
2112	1	613	374	gi|64884	lamA Lf1 [Klebsiella laevis]	68	50	240
2273	1	793	198	gi|581648	epib gene product [Staphylococcus epidermidis]	68	45	396
2548	1	2	385	gi|216869	branched-chain amino acid transport carrier [Pseudomonas aeruginosa] pfr|A38514|A38514 branched-chain amino acid transport protein braz Pseudomonas aeruginosa	68	41	386

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
2955	1	768	400	gi|204179	hypothetical protein [Bacillus subtilis]	68	49	369
2981	1	572	288	gi|508979	GTP-binding protein [Bacillus subtilis]	68	48	285
3014	1	584	294	gi|1524394	ORF-2 upstream of ebeA operon [Bacillus subtilis]	68	45	291
3082	1	336	169	gi|1204696	[fructose-permease IIBC component [Haemophilus influenzae]	68	53	168
3108	1	103	258	gi|217855	heat-shock protein [Arabidopsis thaliana]	68	48	156
3639	1	919	461	gi|1510490	nitrate transport permease protein [Methanococcus jannaschii]	68	47	459
3657	1	1	330	gi|155369	PTS enzyme-II fructose [Xanthomonas campestris]	68	48	330
3823	1	780	391	gi|603768	HutI protein, imidazole-5-propionate hydrolase [Bacillus subtilis]	68	54	390
3982	1	2	277	gi|149435	putative [Lactococcus lactis]	68	47	276
4051	1	1	342	gi|450688	hsdM gene of Ecoprr1 gene product [Escherichia coli] pir[S38437/S38437] hsdM protein - Escherichia coli pir[S09629/S09629] hypothetical protein A - Escherichia coli (SUB 40-520)	68	48	342
4089	1	12	209	gi|1353678	heavy-metal transporting P-type ATPase [Proteus mirabilis]	68	47	198
4143	1	47	187	gi|603769	HucU protein, uronase [Bacillus subtilis]	68	55	141
4148	1	2	352	gi|450688	hsdM gene of Ecoprr1 gene product [Escherichia coli] pir[S38437/S38437] hsdM protein - Escherichia coli pir[S09629/S09629] hypothetical protein A - Escherichia coli (SUB 40-520)	68	51	351
4173	1	2	382	gi|1041097	Pyruvate Kinase [Bacillus psychrophilus]	68	48	381
4182	1	498	250	gi|413968	[ipa-44d gene product [Bacillus subtilis]	68	50	249
4362	2	148	318	gi|450688	hsdM gene of Ecoprr1 gene product [Escherichia coli] pir[S38437/S38437] hsdM protein - Escherichia coli pir[S09629/S09629] hypothetical protein A - Escherichia coli (SUB 40-520)	68	44	171
5	11	9493	8300	gi|143727	putative [Bacillus subtilis]	67	46	1194
31	11	10318	9833	gi|216746	[D-lactate dehydrogenase [Lactobacillus plantarum]	67	41	486
32	3	1560	3155	gi|1098557	renal sodium/dicarboxylate cotransporter [Homo sapiens]	67	46	1596
32	5	4945	4145	gi|1510720	[prephenate dehydratase [Methanococcus jannaschii]	67	51	801
36	5	5350	4268	gi|146216	45% identity with the product of the ORF6 gene from the Erwinia herbicola carotenoid biosynthesis cluster; putative [Bacillus subtilis]	67	58	1083
44	7	4492	5304	gi|1006621	hypothetical protein [Synecocystis sp.]	67	43	813

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
56	7	3943	8481	gi|304131	glutamate synthase large subunit precursor [Azospirillum brasilense] p1r|B46602|B46602 glutamate synthase (NADPH) (EC 1.4.1.13) alpha chain - Azospirillum brasilense	67	52	4539
56	12	13923	14678	gi|1000453	Trer [Bacillus subtilis]	67	48	756
62	8	5092	4757	gi|1113949	orf3 [Bacillus, C-125, alkali-sensitive mutant 18224, Peptide Mutant, 112 aa]	67	45	336
62	10	7570	6338	gi|64655	Na/H antiporter system [Bacillus subtilis]	67	49	1233
99	3	2119	3321	gi|1204349	hypothetical protein [GB:D90212_3] [Haemophilus influenzae]	67	50	1203
102	9	5695	7176	gi|149432	putative [Lactococcus lactis]	67	51	1482
103	13	14549	14049	gi|1408497	lpgD gene product [Bacillus subtilis]	67	48	501
109	15	14821	13982	gi|413976	lpa-52r gene product [Bacillus subtilis]	67	49	840
109	17	14811	15194	gi|413983	lpa-59d gene product [Bacillus subtilis]	67	29	384
121	4	1713	2153	gi|1262335	ymaA [Bacillus subtilis]	67	54	441
122	1	1	1149	gi|143047	ORF [Bacillus subtilis]	67	35	1149
124	5	4060	3518	gi|556885	unknown [Bacillus subtilis]	67	47	543
131	2	4584	3589	gi|1046081	hypothetical protein [GB:D6185_10] [Mycoplasma genitalium]	67	30	996
140	3	2899	2297	gi|146549	kdpC [Bacterichia coli]	67	45	603
142	4	5409	4198	gi|1212775	GTP cyclohydrolase II [Bacillus amyloqueliciens]	67	55	1212
147	5	2913	2374	gi|1303709	YrkA [Bacillus subtilis]	67	44	540
152	8	6341	6673	gi|1377841	unknown [Bacillus subtilis]	67	48	333
161	4	2720	3763	gi|496319	SphX [Synochococcus sp.]	67	47	1044
163	6	1989	3428	gi|595681	2-oxoglutarate/malate translocator [Spinacia oleracea]	67	47	1440
193	3	1351	1626	gi|1511101	shikimate 5-dehydrogenase [Methanococcus jannaschii]	67	53	276
200	2	917	2179	gi|142439	ATP-dependent nuclease [Bacillus subtilis]	67	48	1263
206	10	12445	12801	gi|937347|VECD_	HYPOTHETICAL 21.8 KD PROTEIN IN ASPS 5'REGION.	67	47	357
206	11	13047	14432	gi|732813	branched-chain amino acid carrier [Lactobacillus delbrueckii]	67	46	1386
208	2	1321	809	gi|1033037	100 kDa heat shock protein (Hsp100) [Leishmania major]	67	36	513
238	3	1039	2052	gi|809542	ChrB protein [Erwinia chrysanthemi]	67	42	1014

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
246	2	176	367	gi1215098	lexAonase [Bacteriophage 154a]	67	37	192
276	2	2260	1412	gi1303560	ORF271 [Escherichia coli]	67	50	849
297	6	2223	3056	gi142784	CTAA protein [Bacillus firmus]	67	46	934
307	7	5220	4186	gi1070013	protein-dependent [Bacillus subtilis]	67	43	1035
316	1	36	1028	gi1161061	dioxygenase [Methylobacterium extorquens]	67	52	993
324	3	5650	5030	gi1469784	putative cell division protein ftsW [Enterococcus hirae]	67	49	621
336	1	524	264	gi173122	urea amidolyase [Saccharomyces cerevisiae]	67	45	261
360	1	108	1194	gi130053	HYSTIDYL-TRNA SYNTHETASE (EC 6.1.1.21) [HISTIDINE-TRNA LIGASE] (HISRS)	67	47	1287
364	3	4890	3592	gi151259	HMG-CoA reductase (EC 1.1.1.88) [Pseudomonas mevalonil] pir[A44756]A44756 hydroxymethylglutaryl-CoA reductase (EC 1.1.1.88) Pseudomonas sp.	67	46	1299
365	3	2940	2113	gi1296823	lor2 gene product [Lactobacillus helveticus]	67	47	828
367	2	325	918	gi1039479	ORFU [Lactococcus lactis]	67	47	594
395	3	666	1271	gi11204516	hypothetical protein (CB:U00014_4) [Haemophilus influenzae]	67	55	606
415	1	1800	901	gi1482579	CG site No. 29739 [Escherichia coli]	67	46	900
419	1	1799	903	gi1520752	putative [Bacillus subtilis]	67	48	897
474	1	2	796	gi146906	argininosuccinate synthetase [Streptomyces clavuligerus] pir[S57659]S57659 argininosuccinate synthase (EC 6.3.4.5) - treptomyces clavuligerus	67	49	791
485	2	1921	2226	gi1143434	Rho Factor [Bacillus subtilis]	67	43	306
596	1	1728	865	gi1303853	YqgF [Bacillus subtilis]	67	47	864
700	1	433	218	gi11204628	hypothetical protein (SP:P21498) [Haemophilus influenzae]	67	47	216
806	2	249	647	gi1677947	AppC [Bacillus subtilis]	67	51	399
828	2	340	900	gi177761	lrrA [Synecococcus sp.]	67	37	561
833	1	1407	916	gi142996	regulatory protein [Bacillus subtilis]	67	41	492
856	1	1555	779	gi1780224	ZK970.2 [Caenorhabditis elegans]	67	38	777
888	1	1614	850	gi1437315	PTG start codon [Bacillus licheniformis]	67	40	765
1034	1	1190	597	gi1205113	hypothetical protein (CB:U9201_15) [Haemophilus influenzae]	67	45	594
1062	1	636	319	gi1303850	YqgC [Bacillus subtilis]	67	41	318
1067	1	918	460	gi132950	probable reductase protein - Leishmania major	67	54	459

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
1358	1	3	293	gi|1001369	hypothetical protein [Synecocystis sp.]	67	44	291
2181	1	3	302	gi|1510416	hypothetical protein (SF:P31666) [Methanococcus jannaschii]	67	48	300
3000	1	1	507	gi|517205	67 kDa Myosin-Crossreactive streptococcal antigen [Streptococcus yogenes]	67	56	507
3066	1	464	234	gi|308861	GTP start codon [Lactococcus lactis]	67	46	231
3087	1	454	251	gi|1205366	oligopeptide transport ATP-binding protein [Haemophilus influenzae]	67	46	204
3101	1	2	256	gi|1531541	uroporphyrinogen III methyltransferase [Zea mays]	67	55	255
3598	1	728	393	gi|151259	HMG-CoA reductase (EC 1.1.1.88) [Pseudomonas mevalonii] pir[A46756]A46756 hydroxymethylglutaryl-CoA reductase (EC 1.1.1.88) Pseudomonas sp.	67	56	336
3765	2	584	366	gi|557489	nanD [Bacillus subtilis]	67	45	219
3788	1	658	398	pir[S32915]S329	nitrate reductase alpha chain - Bacillus subtilis (fragment)	67	45	261
3883	1	2	265	gi|704397	cystathionine beta-lyase [Arabidopsis thaliana]	67	46	264
3926	1	2	340	gi|1483199	peptide-synthetase [Amycolatopsis mediterranea]	67	44	339
4417	1	82	396	gi|1205337	ribonucleotide transport ATP-binding protein [Haemophilus influenzae]	67	46	315
2	3	3075	3989	gi|535348	CodV [Bacillus subtilis]	66	42	915
15	6	2273	2542	gi|46491	Smb [Synecococcus PCC7942]	66	37	270
11	9	8059	7826	gi|292046	luciferase [Homo sapiens]	66	44	214
31	10	9034	9258	gi|1204545	mercury scavenger protein [Haemophilus influenzae]	66	48	225
32	6	6347	5253	gi|998342	inducible nitric oxide synthase [Callus gallus]	66	47	1095
44	13	8856	10124	gi|1510751	molybdenum cofactor biosynthesis moaA protein [Methanococcus jannaschii]	66	46	1269
48	2	1276	2868	gi|150209	ORF 1 [Mycoplasma mycoides]	66	40	1593
58	8	7178	8428	gi|665999	hypothetical protein [Bacillus subtilis]	66	47	1251
62	7	5143	4370	gi|1072398	phd gene product [Rhizobium meliloti]	66	40	774
70	14	11693	10998	gi|809660	deoxyribose-phosphate aldolase [Bacillus subtilis] pir[S49455]S49455 deoxyribose-phosphate aldolase (EC 4.1.2.4) - acillus subtilis	66	55	696
76	1	1	1305	gi|142440	ATP-dependent nuclease [Bacillus subtilis]	66	42	1305
91	6	9236	8205	gi|704397	cystathionine beta-lyase [Arabidopsis thaliana]	66	43	1032
102	5	3810	3285	gi|1204323	hypothetical protein (SF:P31805) [Haemophilus influenzae]	66	41	546

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
103	4	3418	2732	gi|971344	nitrate reductase gamma subunit [Bacillus subtilis] sp|P42177|NARI_BACSU NITRATE REDUCTASE GAMMA CHAIN (EC 1.7.99.4). gi|1009369 Respiratory nitrate reductase [Bacillus subtilis] (SUB_160)	66	48	687
109	6	4243	4674	gi|170886	glucosamine-6-phosphate deaminase [Candida albicans] pI-146652|A46652 glucosamine-6-phosphate isomerase (EC 5.3.1.10) - east [Candida albicans]	66	45	432
112	17	17491	17712	gi|1333179	ORF YCR111w [Saccharomyces cerevisiae]	66	33	222
116	2	4667	2637	gi|1491813	gamma-glutamyltranspeptidase [Bacillus subtilis]	66	43	2011
150	5	3189	2989	gi|1146224	putative [Bacillus subtilis]	66	30	201
172	5	3264	3662	gi|755152	highly hydrophobic integral membrane protein [Bacillus subtilis] sp|P42953|TAGC_BACSU TEICHOIC ACID TRANSLOCATION PERMEASE PROTEIN AGG.	66	41	399
174	5	4592	3723	gi|1146241	pantothenate synthetase [Bacillus subtilis]	66	49	870
175	4	3209	2880	gi|642655	unknown [Rhizobium meliloti]	66	29	310
175	11	8743	7994	gi|854655	Na/H antiporter system [Bacillus alcalophilus]	66	43	750
190	5	7079	5727	gi|451072	di-tripeptide transporter [Lactococcus lactis]	66	40	1353
195	15	13919	13713	gi|1322411	unknown [Mycobacterium tuberculosis]	66	42	207
217	3	2822	2595	gi|1143542	alternative stop codon [Rattus norvegicus]	66	36	228
233	9	7133	6135	gi|1458327	P08P3.4 gene product [Caenorhabditis elegans]	66	47	999
238	1	41	1041	gi|809541	Chra protein [Xenopus laevis]	66	42	999
241	1	2102	1053	gi|153067	peptidoglycan hydrolase [Staphylococcus aureus]	66	53	1050
261	1	1178	648	gi|1510859	M. jannaschii predicted coding region M0790 [Methanococcus jannaschii]	66	40	531
263	3	3731	2973	gi|1205865	tetrahydrodipicolinate N-succinyltransferase [Haemophilus influenzae]	66	47	759
272	8	6548	5484	gi|882101	high affinity nickel transporter [Alcaligenes eutrophus] sp|P23516|HONN_ALCEU HIGH-AFFINITY NICKEL TRANSPORT PROTEIN.	66	44	1065
276	3	2805	2104	gi|1208965	hypothetical 23.3 kd protein [Escherichia coli]	66	47	702
278	2	2830	1784	gi|1488662	phosphatase-associated protein [Bacillus subtilis]	66	48	1047
278	3	3810	2952	gi|303560	ORF271 [Escherichia coli]	66	45	879
279	2	3894	2218	gi|1185289	2-succinyl-6-hydroxy-2,4-cyclohexadiene-1- carboxylate synthase [Bacillus subtilis]	66	48	1677
288	4	2535	2275	gi|1256625	putative [Bacillus subtilis]	66	42	261
292	2	1133	942	gi|1511604	M. jannaschii predicted coding region M1651 [Methanococcus jannaschii]	66	30	192

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
294	1	1116	559	gi|216314	esterase [Bacillus stearothermophilus]	66	45	558
297	4	2913	1978	gi|994794	cytochrome c assembly factor [Bacillus subtilis] sp|P24009|COXII_BACSU PROBABLE CYTOCHROME C OXIDASE ASSEMBLY FACTOR.	66	45	936
316	4	2053	2682	gi|1107839	alginate lyase [Pseudomonas aeruginosa]	66	40	630
338	4	2460	2302	gi|520750	biotin synthetase [Bacillus sphaericus]	66	59	159
339	1	1214	735	gi|467468	7, 8-dihydro-6-hydroxymethylpterin-pyrophosphokinase [Bacillus subtilis]	66	52	480
363	1	3	863	gi|581649	epiC gene product [Staphylococcus epidermidis]	66	47	861
366	2	232	483	gi|1103505	unknown [Schizosaccharomyces pombe]	66	53	252
367	4	2468	1845	sp|P20692|TYRA	PREPHENATE DEHYDROGENASE (EC 1.3.1.12) (PDH).	66	50	624
372	3	2150	1599	gi|467416	unknown [Bacillus subtilis]	66	38	552
378	1	212	1009	gi|147309	purine nucleoside phosphorylase [Escherichia coli]	66	50	798
401	1	1	462	gi|388263	p-aminobenzoic acid synthase [Streptomyces griseus] p-aminobenzoic acid synthase - Streptomyces riseus	66	46	462
404	7	4826	5254	gi|606744	cytidine deaminase [Bacillus subtilis]	66	51	429
411	2	1738	1103	gi|1460081	unknown [Mycobacterium tuberculosis]	66	44	636
420	1	2	541	gi|1048024	Na+ ATPase subunit J [Mycoplasma genitalium]	66	49	540
431	1	1	858	gi|1500008	M. jannaschii predicted coding region M3134 [Methanococcus jannaschii]	66	50	858
443	7	5679	5299	gi|852076	MrgA [Bacillus subtilis]	66	46	381
444	3	3405	2413	gi|153047	lysostaphin (tgg start codon) [Staphylococcus simulans] p|A25881|A25881 lysostaphin precursor - Staphylococcus simulans sp|P10547|LSTP_STASI LYSOSTAPHIN PRECURSOR (EC 3.5.1.-)	66	51	993
561	1	956	480	gi|1204905	DNA-3-methyladenine glycosylase I [Haemophilus influenzae]	66	45	477
562	3	1066	1383	gi|1046082	M. genitalium predicted coding region M3372 [Mycoplasma genitalium]	66	52	318
576	1	11	724	gi|1305014	ORF_0234 [Escherichia coli]	66	43	714
577	3	1190	903	gi|1001353	hypothetical protein (Synecocystis sp.)	66	52	288
584	1	2	331	sp|P24204|YEBB_	HYPOTHETICAL 46.7 KD PROTEIN IN MSBB-RIVB INTERGENIC REGION (ORF1).	66	48	330
592	1	1410	706	gi|928839	ORF266; putative [Lactococcus lactis phage BK3-T]	66	51	705
601	1	1433	720	gi|1488695	novel antigen: orf-2 [Staphylococcus aureus]	66	55	714

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
619	3	468	845	gi|746573	similar to H. musculus transport system membrane protein, N-ramp PIR:A40739 and S. cerevisiae SHP1 protein (PIR:A45154) Caenorhabditis elegans	66	45	378
706	2	561	355	gi|804808	unknown protein (Rattus norvegicus)	66	46	207
734	2	673	512	gi|1519085	phosphatidylcholine binding immunoglobulin heavy chain IGH variable region (Mus musculus)	66	60	162
740	1	3	317	gi|1209272	argininosuccinate lyase (Campylobacter jejuni)	66	47	315
764	1	310	747	gi|435296	alkaline phosphatase like protein (Lactococcus lactis) pir|S39339|S39339 alkaline phosphatase-like protein - Lactococcus actis	66	42	438
852	1	338	171	gi|536955	CG Site No. 361 (Escherichia coli)	66	43	168
886	1	3	158	gi|289272	ferrichrome-binding protein (Bacillus subtilis)	66	44	156
889	1	462	232	gi|833061	HCMVUL77 (AA 1-642) (Human cytomegalovirus)	66	66	231
893	1	2	247	gi|149008	putative Helicobacter pylori	66	45	246
900	1	1425	733	gi|580842	P3 (Bacillus subtilis)	66	51	693
906	2	2300	1473	gi|790945	aryl-alcohol dehydrogenase (Bacillus subtilis)	66	53	828
947	1	79	549	gi|410117	diaminopimelate decarboxylase (Bacillus subtilis)	66	47	471
950	1	1100	552	gi|48713	orf145 (Staphylococcus aureus)	66	35	549
955	2	89	475	gi|1204390	uridine kinase (uridine monophosphokinase) (Haemophilus influenzae)	66	50	387
981	2	1308	997	gi|457146	rhoptry protein (Plasmodium yoelii)	66	38	312
986	1	25	315	gi|305002	ORF_4356 (Escherichia coli)	66	31	291
1057	1	3	203	gi|1303853	YqgP (Bacillus subtilis)	66	40	201
1087	1	1	294	gi|575913	unknown (Saccharomyces cerevisiae)	66	53	294
1105	1	1	231	gi|1045799	methylgalactoside permease ATP-binding protein (Mycoplasma genitalium)	66	46	231
1128	1	2	574	gi|1001493	hypothetical protein (Synechocystis sp.)	66	46	573
1150	1	498	250	gi|1499034	M. jannaschii predicted coding region M0255 (Methanococcus jannaschii)	66	40	249
1180	2	707	453	gi|215908	DNA polymerase (g3) (Bacteriophage T4)	66	46	255
1208	1	1123	567	gi|1256653	DNA-binding protein (Bacillus subtilis)	66	58	537
1342	1	1	402	gi|1208474	hypothetical protein (Synechocystis sp.)	66	53	402
1761	2	589	398	gi|215811	tail fiber protein (Bacteriophage T3)	66	50	192

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
1983	1	499	251	gi|1045935	DNA helicase II [Mycoplasma genitalium]	66	40	249
2103	2	176	400	gi|923798	precursor for the major serosolite surface antigens [Plasmodium elciaparum]	66	46	225
2341	1	373	188	gi|1256623	exodeoxyribonuclease [Bacillus subtilis]	66	38	186
2458	1	325	164	gi|1019410	unknown [Schizosaccharomyces pombe]	66	47	162
2505	1	468	235	gi|1510394	putative transcriptional regulator [Methanococcus jannaschii]	66	39	234
2525	1	558	280	gi|1000695	cytotoxin L [Clostridium sordellii]	66	44	279
2935	1	3	275	gi|765073	autolysin [Staphylococcus aureus]	66	47	273
3005	1	114	305	gi|1205784	heterocyst maturation protein [Haemophilus influenzae]	66	46	192
3088	1	80	277	gi|1303813	Yqew [Bacillus subtilis]	66	42	198
3071	1	1	189	gi|1070014	protein-dependent [Bacillus subtilis]	66	41	189
3081	1	404	225	gi|984212	unknown [Schizosaccharomyces pombe]	66	44	180
3090	2	580	386	gi|1204987	DNA polymerase III, alpha chain [Haemophilus influenzae]	66	48	195
3318	1	1	387	gi|1009366	respiratory nitrate reductase [Bacillus subtilis]	66	49	387
3739	1	798	400	gi|1109684	ProV [Bacillus subtilis]	66	47	399
3796	1	402	202	gi|853760	acyl-CoA dehydrogenase [Bacillus subtilis]	66	60	201
3924	1	525	347	gi|563952	glucanase pumosee [Bacillus licheniformis]	66	46	249
4240	1	3	350	gi|151259	HM-CoA reductase (EC 1.1.1.88) [Pseudomonas mevalonii] pir[A44756]A44756 hydroxymethylglutaryl-CoA reductase (EC 1.1.1.88) Pseudomonas sp.	66	51	348
4604	1	7	234	pir[A26713]BHHC	hemocyanin subunit II - Atlantic horseshoe crab	66	46	228
4	9	8845	9750	gi|145646	cymR [Escherichia coli]	65	35	906
6	5	2708	3565	gi|887824	ORF_0310 [Escherichia coli]	65	47	858
13	1	1993	998	gi|143402	recombination protein (tsg start codon) [Bacillus subtilis] gi|1303923 RecN [Bacillus subtilis]	65	44	996
15	7	2493	3524	gi|1403126	csd gene product [Alcaligenes eutrophus]	65	38	1032
18	3	1908	1372	gi|149187	acylttransferase [Saccharomyces cerevisiae]	65	50	537
21	3	1467	2492	gi|149518	phosphoribosyl anthranilate transferase [Lactococcus lactis] (pir[S35126/S35126]entraniolate phosphoribosyltransferase [EC 4.2.18] - Lactococcus lactis subsp. lactis	65	52	1026
25	4	3374	4312	gi|1502420	malonyl-CoA:Acyl carrier protein transacylase [Bacillus subtilis]	65	44	939

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
27	2	390	626	gi|1212729	YohJ (Bacillus subtilis)	65	45	237
31	12	11040	10387	gi|509245	D-hydroxyisocaproate dehydrogenase (Lactobacillus delbrueckii)	65	41	654
38	24	19172	19528	gi|547	H-protein (Plavaria cronquistii)	65	41	357
44	2	790	1746	gi|405882	yeik (Escherichia coli)	65	46	957
44	12	9356	8832	gi|1205905	molybdenum cofactor biosynthesis protein (Haemophilus influenzae)	65	50	525
45	8	6635	7588	gi|493074	Apba protein (Salmonella typhimurium)	65	46	954
51	2	580	1503	gi|580897	OppB gene product (Bacillus subtilis)	65	45	924
52	1	225	953	gi|1205518	NAD(P)H-flavin oxidoreductase (Haemophilus influenzae)	65	45	729
55	4	1339	1058	pir|A4459|A444	tropomyosin T beta TmT-5 - rabbit	65	41	282
67	9	7421	8272	gi|143607	sporulation protein (Bacillus subtilis)	65	42	852
73	5	4446	5375	gi|1204896	lysophospholipase L2 (Haemophilus influenzae)	65	37	910
74	1	954	478	gi|1204844	H. influenzae predicted coding region HI0594 (Haemophilus influenzae)	65	50	477
77	1	2	757	gi|1046082	M. genitalium predicted coding region MG372 (Mycoplasma genitalium)	65	46	756
77	2	795	1433	gi|1222116	permease (Haemophilus influenzae)	65	37	639
81	3	4728	3454	gi|1001708	hypothetical protein (Synechocystis sp.)	65	49	1275
91	7	8548	8357	gi|1399263	cystathionine beta-lyase (Escherichia coli)	65	40	192
98	3	1808	1988	gi|467423	unknown (Bacillus subtilis)	65	38	381
98	4	2250	2987	gi|467424	unknown (Bacillus subtilis)	65	45	738
102	3	2598	2119	gi|1511532	N-terminal acetyltransferase complex, subunit ARD1 (Methanococcus jannaschii)	65	39	480
102	4	3647	2862	gi|1204637	H. influenzae predicted coding region HI0388 (Haemophilus influenzae)	65	32	786
103	9	10851	9841	gi|142695	S-adenosyl-L-methionine:uroporphyrinogen-III methyltransferase Bacillus megaterium	65	47	1011
103	10	10439	10119	gi|710021	Nitrite reductase (nirD) (Bacillus subtilis)	65	51	321
106	2	262	1140	gi|39881	ORF 311 (AA 1-311) (Bacillus subtilis)	65	44	879
109	5	3909	4268	gi|1204399	glucosamine-6-phosphate deaminase protein (Haemophilus influenzae)	65	44	360
109	10	7165	8595	gi|1536955	ICG Site No. 361 (Escherichia coli)	65	41	1431

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
110	4	3688	3915	gi|407881	stringent response-like protein (Streptococcus equisimilis) pif[S39975] stringent response-like protein - Streptococcus quiesimilis	65	45	228
110	5	3882	4295	gi|407880	ORF1 (Streptococcus equisimilis)	65	50	414
110	6	4231	4380	gi|1139574	ORF2 (Streptomyces griseus)	65	56	150
112	110	9218	8640	gi|1204571	H. influenzae predicted coding region H0318 (Haemophilus influenzae)	65	52	579
112	112	112049	11288	gi|710496	transcriptional activator protein (Bacillus brevis)	65	32	762
125	1	2	202	gi|1151158	repeat organellar protein (Plasmodium chebaudi)	65	39	201
126	1	3	422	gi|37589	precursor (Homo sapiens)	65	46	420
127	11	10733	12658	gi|1064809	homologous to sp:ITRA_ECOLI (Bacillus subtilis)	65	41	1926
143	8	7543	7004	gi|216513	mutator mutT (AT-CC transversion) (Escherichia coli)	65	56	540
145	5	3587	3838	gi|1209768	D02orf569 (Mycoplasma pneumoniae)	65	27	252
150	4	3482	2841	gi|1146225	putative (Bacillus subtilis)	65	37	642
166	1	3858	1948	gi|148304	beta-1,4-N-acetylmuramoylhydrolase (Enterococcus hirae) pif[A42296] A42296 lyszyme 2 (EC 3.2.1.-) precursor - Enterococcus faec (ATCC 9790)	65	50	1911
188	6	3195	4178	gi|151943	ORF3; putative (Rhodospirillum rubrum)	65	46	984
189	9	4982	4785	gi|58812	ORF 1V (AA 1-487) (Pigment mosaic virus)	65	40	198
195	8	7908	5272	gi|145220	alanyl-tRNA synthetase (Escherichia coli)	65	44	2637
195	7	10599	8104	gi|882711	exonuclease V alpha-subunit (Escherichia coli)	65	38	2496
206	16	16896	18191	gi|468115	ornithine acetyltransferase (Bacillus subtilis)	65	53	1296
217	4	3844	3215	gi|1205974	5'-guanylate kinase (Haemophilus influenzae)	65	41	630
220	4	5265	3751	gi|580920	rodD (gtaA) polypeptide (AA 1-673) (Bacillus subtilis) pif[S06048] S06048 probable rodD protein - Bacillus subtilis sp[P13464] P13464 BACSU PROBABLE POLY(GLYCEROL-PHOSPHATE) LPHI-GLUCOSYLTRANSFERASE (EC 2.4.1.52) (TECHIOIC ACID BIOSYNTHESIS ROUTE IN E.)	65	40	1515
226	5	2327	3709	gi|1146200	DNA or RNA helicase, DNA-dependent ATPase (Bacillus subtilis)	65	46	1381
237	3	1902	2513	gi|1149379	H188d (Lactococcus lactis)	65	46	612
241	4	4968	4195	gi|11205308	ribonuclease III (EC 3.1.26) (RNase III) (Haemophilus influenzae)	65	50	774
252	1	1278	940	gi|11204989	hypothetical protein (GD:U00022_9) (Haemophilus influenzae)	65	40	319
261	5	4780	3794	gi|1145927	fecD (Escherichia coli)	65	43	987

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
274	1	3	278	gi|496558	orfX [Bacillus subtilis]	65	42	276
301	2	982	815	gi|67418	unknown [Bacillus subtilis]	65	45	168
307	4	3586	2864	gi|1070014	protein-dependent [Bacillus subtilis]	65	40	723
335	2	2286	1399	gi|146913	N-acetylglucosamine transport protein [Escherichia coli] pir|828895|WQEC2N phosphotransferase system enzyme II (EC 7.1.69), N-acetylglucosamine-specific - Escherichia coli sp|P09323|PTAA_SCO1 PTS SYSTEM, N-ACETYLGLUCOSAMINE-SPECIFIC IABC COMPONENT [E1A]	65	50	888
338	5	4120	3170	gi|1277029	biotin synthase [Bacillus subtilis]	65	49	951
343	3	1490	2800	gi|143264	membrane-associated protein [Bacillus subtilis]	65	48	1311
344	4	2761	2531	gi|1050540	tRNA-glutamine synthetase [Lupinus luteus]	65	34	231
358	3	3421	3621	gi|1146220	NAD+ dependent glycerol-3-phosphate dehydrogenase [Bacillus subtilis]	65	47	201
364	1	238	499	gi|1340128	ORF1 [Staphylococcus aureus]	65	51	462
379	1	1	576	gi|143331	alkaline phosphatase regulatory protein [Bacillus subtilis] pir|A27650|A27650 regulatory protein phoR - Bacillus subtilis sp|P23545|PHO_R_BACSU ALKALINE PHOSPHATASE SYNTHESIS SENSOR PROTEIN PHO R (EC 2.7.3.-)	65	40	576
379	3	3666	4346	gi|143268	1-dihydrolipamide transsuccinylase (odhB; EC 2.3.1.61) [Bacillus subtilis]	65	50	681
428	1	187	483	gi|1420465	ORF YOR195W [Saccharomyces cerevisiae]	65	45	297
438	2	272	838	gi|143498	dhgS protein [Bacillus subtilis]	65	38	567
444	11	9280	10215	gi|1204756	ribokinase [Haemophilus influenzae]	65	47	936
449	2	1241	1531	gi|599848	Na/H antiporter homolog [Lactococcus lactis]	65	41	291
478	2	1452	865	gi|1045942	glycyl-tRNA synthetase [Hycoplasma genitalium]	65	39	588
479	1	1032	517	gi|1498192	putative [Pseudomonas aeruginosa]	65	40	516
480	6	4312	5637	gi|115662	UDP-N-acetylglucosamine 1-carboxyvinyl transferase [Acinetobacter alcoaceticus]	65	48	1326
484	1	2	410	gi|146551	transmembrane protein (kdpD) [Escherichia coli]	65	44	429
499	1	54	932	gi|603456	reductase [Leishmania major]	65	53	879
505	1	914	459	gi|1518853	OafA [Salmonella typhimurium]	65	39	456
571	2	1509	883	gi|49399	open reading frame upstream glnE [Escherichia coli] ir|S37754|S37754 hypothetical protein XE (glnE 3' region) - Escherichia coli	65	44	627
611	2	506	270	gi|10961	RAP-2 [Plasmodium falciparum]	65	40	237

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
705	1	564	283	gi|710020	nitrite reductase (nirB) [Bacillus subtilis]	65	52	282
712	1	1	177	gi|289272	ferrichrome-binding protein [Bacillus subtilis]	65	37	177
712	2	196	356	gi|289272	ferrichrome-binding protein [Bacillus subtilis]	65	37	159
743	1	2	631	gi|310631	ATP binding protein [Streptococcus gordonii]	65	45	630
749	2	393	779	gi|167374	single strand DNA-binding protein [Bacillus subtilis]	65	29	387
762	1	1698	850	gi|160399	multidrug resistance protein [Plasmodium falciparum]	65	48	849
788	1	85	315	gi|1129096	unknown protein [Bacillus sp.]	65	35	231
850	1	1	408	gi|1006604	hypothetical protein [Synecocystis sp.]	65	37	408
908	1	1	434	gi|1199546	2362 [Saccharomyces cerevisiae]	65	46	444
925	1	1	174	gi|1256653	DNA-binding protein [Bacillus subtilis]	65	54	174
1031	1	26	232	gi|238657	AppCyclochrome d oxidase, subunit I homolog [Escherichia coli, K12, eptide, 514 aa]	65	47	207
1037	1	414	262	gi|1491813	gamma-glutamyltranspeptidase [Bacillus subtilis]	65	46	153
1053	1	348	175	gi|642655	unknown [Rhizobium meliloti]	65	34	174
1149	1	1399	752	gi|1162980	ribulose-5-phosphate 3-epimerase [Spinacia oleracea]	65	48	668
1214	1	881	495	gi|1205959	lactam utilization protein [Haemophilus influenzae]	65	45	387
1276	1	476	276	pir|S35493|S354	site-specific DNA-methyltransferase Stc1 (EC 2.1.1.-) - Stenotrophomonas sanguis	65	34	201
1276	2	900	577	gi|473794	'ORF' [Escherichia coli]	65	34	124
2057	1	272	138	gi|633699	TrnH [Yersinia enterocolitica]	65	21	135
2521	1	336	169	gi|1045789	hypothetical protein (GB:U14001_76) [Mycoplasma genitalium]	65	41	168
2974	1	590	297	gi|152052	penicillinase-selective amidase [Rhodococcus sp.]	65	45	294
3031	1	306	154	pir|JQ1024|JQ10	hypothetical 30K protein (DWR140 5' region) - fruit fly (Drosophila melanogaster)	65	44	153
3069	1	3	278	gi|144906	product homologous to E. coli thiorodoxin reductase; J. Biol. Chem. 1988) 263:9015-9019, and to F52a protein of alkyl hydroperoxide oxidase from S. typhimurium; J. Biol. Chem. (1990) 265:10533-10540; pen reading frame A [Clostridium pasteurianum]	65	46	276
3146	1	282	142	gi|49315	ORF1 gene product [Bacillus subtilis]	65	47	141
3170	1	679	341	gi|1507711	indolepyruvate decarboxylase [Erwinia herbicola]	65	44	339

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
3546	1	1	303	gi1450688	hsdm gene of EcoRII gene product [Escherichia coli] pir[S38437/S38437 hsdM protein - Escherichia coli pir[S09629/S09629 hypothetical protein A - Escherichia coli (SUB 40-520)]	65	42	303
3782	1	2	328	gi1166412	NADH-glutamate synthase (Medicago sativa)	65	42	327
3990	1	374	189	gi11009366	Respiratory nitrate reductase [Bacillus subtilis]	65	53	186
4032	1	613	308	gi11323127	ORF YGR087c [Saccharomyces cerevisiae]	65	50	306
4278	2	726	364	gi11197667	vitallogenin [Anolis pulchellus]	65	42	363
19	4	4259	5518	gi1145727	dead [Escherichia coli]	64	45	1260
19	6	7639	6926	gi11016232	ycf27 gene product [Cyanophora paradoxa]	64	36	714
20	8	7053	6454	gi1765073	autolysin [Staphylococcus aureus]	64	47	600
31	13	112706	11537	gi1416009	lipa-85d gene product [Bacillus subtilis]	64	45	1170
33	4	2388	4364	gi11204696	fructose-permease IIBC component [Haemophilus influenzae]	64	47	1977
36	3	1871	3013	gi1290503	glutamate permease [Escherichia coli]	64	40	1143
37	6	4065	4409	gi139815	orf 2 gene product [Bacillus subtilis]	64	46	345
45	9	7852	8760	gi11230585	nucleotide sugar epimerase [Vibrio cholerae O139]	64	53	909
53	3	1540	1899	gi11303961	VqjJ [Bacillus subtilis]	64	50	360
56	6	4793	3855	gi1457514	glcC [Bacillus subtilis]	64	45	939
56	24	30002	30247	gi1470331	similar to zinc fingers [Caenorhabditis elegans]	64	42	246
62	4	2759	2421	gi1642655	unknown [Rhizobium melliottii]	64	28	339
85	6	7178	6027	gi1457702	5-aminimidazole ribonucleotide-carboxylase [Pichia methanolic] pir[S39112/S39112 phosphoribosylaminimidazole carboxylase (EC 1.1.21) - yeast [Pichia methanolica]	64	46	1152
96	9	9251	10030	gi11511513	ABC transporter, probable ATP-binding subunit [Methanococcus jannaschii]	64	42	780
100	1	1	600	gi1765073	autolysin [Staphylococcus aureus]	64	44	600
106	5	3868	4854	gi1466778	lysine specific permease [Escherichia coli]	64	46	987
123	2	838	554	gi1467484	unknown [Bacillus subtilis]	64	47	285
127	8	7514	7810	gi1210061	serotype-specific antigen [African horse sickness virus] pir[S27891/S27891 capsid protein VP2 - African horse sickness virus]	64	28	297
131	7	7134	6721	gi11511160	M. jannaschii predicted coding region MJ1163 [Methanococcus jannaschii]	64	46	414

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match	match gene name	% sim	% ident	length (nt)
142	5	5455	4817	gt|1173517	riboflavin synthase alpha subunit (Actinobacillus pleuropneumoniae)	64	44	639
143	1	709	356	ptc|A32950|A329	probable reductase protein - Leishmania major	64	52	354
149	10	3555	3295	gt|398151	major surface antigen MSG2 (Pneumocystis carinii)	64	44	261
154	4	3134	2307	gt|984587	DlnP (Escherichia coli)	64	50	828
161	5	3855	4880	gt|903104	ORF72 (Bacillus subtilis)	64	37	1026
165	1	33	791	gt|467483	unknown (Bacillus subtilis)	64	38	759
175	6	6355	4714	gt|1072398	phad gene product (Rhizobium meliloti)	64	42	1512
188	3	2042	2500	gt|1001961	MHC class II analog (Staphylococcus aureus)	64	45	459
195	14	13667	13446	gt|396380	no definition line found (Escherichia coli)	64	47	222
206	15	16429	16938	gt|304134	argC (Bacillus stearothermophilus)	64	49	510
215	1	560	282	gt|142359	ORF 6 (Azotobacter vinelandii)	64	39	279
243	7	7818	6928	gt|414014	lpa-90d gene product (Bacillus subtilis)	64	49	891
258	2	1330	845	gt|664754	P17 (Listeria monocytogenes)	64	38	486
259	1	462	232	gt|1499663	M. jannaschii predicted coding region M0837 (Methanococcus jannaschii)	64	52	231
263	6	6565	5567	gt|142828	aspartate semialdehyde dehydrogenase (Bacillus subtilis) sp|Q04797|PIIAS_DACSU ASPARTATE-SEMIALDEHYDE DEHYDROGENASE (EC 2.1.1.11) (ASA DEHYDROGENASE)	64	48	999
271	1	3	1163	gt|467091	hflX; B2235_C2_202 (Mycobacterium leprae)	64	44	1161
280	1	173	1450	gt|1303839	YqfR (Bacillus subtilis)	64	43	1278
293	1	2532	1267	gt|147345	primosomal protein n' (Escherichia coli)	64	45	1266
295	2	742	1488	gt|459266	potential membrane spanning protein (Staphylococcus hominis) pir|S42932|S42932 potential membrane spanning protein - taphylococcus hominis	64	39	747
301	5	1625	1446	gt|580835	lysine decarboxylase (Bacillus subtilis)	64	35	180
315	4	5064	3949	gt|143396	quinol oxidase (Bacillus subtilis)	64	45	1116
321	1	1264	635	gt|710496	transcriptional activator protein (Bacillus brevis)	64	41	630
333	5	4520	4239	gt|1314295	ORF2; putative 19 kDa protein (Listeria monocytogenes)	64	43	282
342	1	1	549	gt|142940	ftsA (Bacillus subtilis)	64	38	549
353	3	2878	2324	gt|537049	ORF_0470 (Escherichia coli)	64	44	555

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
379	2	827	3658	[gi|525295|A328|oxoglutarate dehydrogenase (liposamide) (EC 1.2.4.2) - Bacillus subtilis]		64	47	2832
404	6	4429	4839	[gi|A36933|A369|diacylglycerol kinase homolog - Streptococcus mutans]		64	35	411
407	1	2020	3133	[gi|969026|orfX (Bacillus subtilis)]		64	41	888
425	1	1109	591	[gi|1146177|phosphotransferase system glucose-specific enzyme II (Bacillus subtilis)]		64	44	519
443	6	4082	4798	[gi|1147309|purine nucleoside-phosphorylase (Escherichia coli)]		64	51	717
450	2	1035	1604	[gi|106376|ORF_0162 (Escherichia coli)]		64	38	570
470	5	1680	6107	[gi|1369948|host interacting protein (Bacteriophage B1)]		64	45	4428
486	4	1911	1471	[gi|11405582|spermidine/putrescine transport system permease protein (Haemophilus influenzae)]		64	35	441
497	1	2217	1159	[sp|P36929|PMU_E|PMU PROTEIN]		64	38	1059
501	1	3	410	[gi|1142450|ehc protein (Bacillus subtilis)]		64	38	408
514	1	3	290	[gi|1204896|H. influenzae predicted coding region H10238 (Haemophilus influenzae)]		64	34	288
551	4	3162	3323	[gi|1204511|bacterioferritin comigratory protein (Haemophilus influenzae)]		64	41	162
603	4	759	956	[gi|755823|NADH dehydrogenase F (Streptococcus amarae)]		64	35	198
653	2	940	746	[gi|1213234|dicarboxylic amino acids Dip5p permease (Saccharomyces cerevisiae)]		64	41	195
660	3	3801	2257	[sp|P46133|YUMIL|HYPOTHETICAL PROTEIN IN OCT 5' REGION (FRAGMENT)]		64	39	1345
695	1	11	502	[gi|1001383|hypothetical protein (Synecocystis sp.)]		64	41	492
702	1	3	752	[gi|142865|DNA primase (Bacillus subtilis)]		64	46	750
826	1	1	339	[gi|971336|arginyl tRNA synthetase (Bacillus subtilis)]		64	50	339
838	1	1831	917	[gi|1354775|pfos/R (Treponema pallidum)]		64	41	915
864	3	675	944	[gi|39833|cyclomaltodextrin glucanotransferase (Bacillus stearothermophilus) i|J39835|cyclomaltodextrin glucanotransferase (Bacillus stearothermophilus)]		64	47	270
887	1	3	677	[gi|1153002|enterotoxin type 2 precursor (Staphylococcus aureus) p|A28179|A28179 enterotoxin E precursor - Staphylococcus aureus sp|P12993|ETX_E_STAAN ENTEROTOXIN TYPE E PRECURSOR (SE)]		64	46	675
928	2	1172	963	[gi|111976|fibrinogen-binding protein (Staphylococcus aureus) p|S34270|S34270|fibrinogen-binding protein - Staphylococcus aureus]		64	41	210
1049	2	800	606	[gi|11049115|Pap60 (Bacillus subtilis)]		64	42	195
1067	2	999	748	[gi|1151072|HhaA precursor (Haemophilus ducreyi)]		64	50	252

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
1120	1	50	202	gi|142439	ATP-dependent nuclease [Bacillus subtilis]	64	30	153
1125	1	751	377	gi|581648	epiB gene product [Staphylococcus epidermidis]	64	44	375
1688	1	402	214	pir|A01365|TVMS	transforming protein K-tas - mouse	64	47	189
2472	1	2	358	gi|487282	Na ⁺ -ATPase subunit J [Enterococcus hirae]	64	36	357
2889	1	520	356	gi|304134	argC [Bacillus stearothermophilus]	64	50	165
3013	1	630	352	gi|551699	cytochrome oxidase subunit I [Bacillus firmus]	64	51	279
3034	1	546	274	gi|1204349	hypothetical protein GB:G8:P0212.3 [Haemophilus influenzae]	64	50	273
3197	1	613	308	gi|1009366	respiratory nitrate reductase [Bacillus subtilis]	64	46	306
3303	1	90	362	gi|1107839	arginate lyase [Pseudomonas aeruginosa]	64	43	273
3852	2	82	288	gi|216746	D-lactate dehydrogenase [Lactobacillus plantarum]	64	42	207
3868	1	1	312	gi|149435	putative [Lactococcus lactis]	64	48	312
3918	1	660	331	gi|5532	acetyl-CoA acyltransferase [Vibrio parvulus]	64	46	330
4000	1	112	378	gi|994688	unknown [Saccharomyces cerevisiae]	64	44	267
4009	1	81	368	gi|30372	greB gene product [Bacillus brevis]	64	41	288
4166	1	2	349	gi|149435	putative [Lactococcus lactis]	64	46	348
4366	1	2	307	gi|216267	ORF2 [Bacillus megaterium]	64	44	306
4457	1	2	400	gi|1197667	vitellogenin [Anolis pulchellus]	64	43	399
11	3	1539	2438	gi|438228	ORF C [Staphylococcus aureus]	63	32	900
24	7	5611	5423	gi|1369943	ai1 gene product [Bacteriophage ai1]	63	34	189
29	1	1	390	gi|467441	expressed at the end of exponential growth under conditions in which the enzymes of the TCA cycle are repressed [Bacillus subtilis] gi|467441	63	43	390
					expressed at the end of exponential growth under conditions in which the enzymes of the TCA cycle are repressed Bacil			
31	6	6329	5712	gi|496943	ORF [Saccharomyces cerevisiae]	63	47	618
44	123	14669	15019	pir|A04446|OPEC	hypothetical protein P-92 - Escherichia coli	63	36	351
48	6	4403	6250	gi|43498	pyruvate synthase [Halobacterium halobium]	63	42	1848
50	5	3869	4738	gi|413967	lipa-43d gene product [Bacillus subtilis]	63	43	870
53	6	6764	5742	gi|474176	regulator protein [Staphylococcus xyloosus]	63	49	1023

TABLE 2

3. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	Length (nt)
56	14	15880	17607	gi|467409	DNA polymerase III subunit [Bacillus subtilis]	63	44	1728
57	11	7945	7376	gi|537036	ORF_0158 [Escherichia coli]	63	39	570
62	3	2479	2114	gi|142656	unknown [Rhizobium meliloti]	63	41	366
70	8	6562	7353	gi|1399821	PhoC [Rhizobium meliloti]	63	46	792
75	2	223	927	gi|149376	HisG [Lactococcus lactis]	63	45	705
78	5	4912	4403	gi|413950	lpa-26d gene product [Bacillus subtilis]	63	42	510
91	5	9076	7220	gi|466997	metH2, B2126-Cl157 [Mycobacterium leprae]	63	41	1857
91	8	10566	9448	gi|1204346	cytathionine gamma-synthase [Haemophilus influenzae]	63	45	1119
120	1	21	1508	gi|882657	sulfite reductase (NADPH) flavoprotein beta subunit [Escherichia coli]	63	46	1488
120	4	2722	4125	gi|665994	hypothetical protein [Bacillus subtilis]	63	34	1404
127	7	6064	7566	gi|40162	murG gene product [Bacillus subtilis]	63	44	1503
149	6	2321	2106	gi|148503	dnak [Erysioplotheix thalioptachiae]	63	40	216
149	26	10445	10170	gi|48070	ORF 2, has similarity to DNA polymerase (Saccharomyces kluyveri) r1515961|S15961 hypothetical protein 2 - yeast [Saccharomyces uverii] plasmid pSKL	63	42	276
164	2	507	1298	gi|145476	CDP-diglyceride synthetase [Escherichia coli]	63	44	792
166	6	9909	8164	gi|151932	fructosa enzyme II [Rhodospirillum rubrum]	63	41	1746
169	4	1704	1886	gi|152886	elongation factor Ts (tsf) [Spiroplasma citri]	63	48	183
188	5	3145	2951	gi|1114547	ClpY C01114 grp18 protein [Podospora anserina]	63	42	195
195	13	11767	12804	gi|606100	ORF_0335 [Escherichia coli]	63	40	1038
201	2	607	2283	gi|433534	arginyl-tRNA synthetase [Corynebacterium glutamicum] pir|A09916|A09916 arginine--tRNA ligase (EC 6.1.1.19) - corynebacterium glutamicum	63	46	1677
206	16	15893	16489	gi|580828	N-acetyl-glutamate-gamma-semialdehyde dehydrogenase [Bacillus subtilis]	63	49	597
220	5	7769	5766	gi|216334	laccA protein [Bacillus subtilis]	63	42	2004
221	1	74	907	gi|677945	AppA [Bacillus subtilis]	63	42	834
227	3	944	1708	gi|1510558	isobutyric acid synthase [Methanococcus jannaschii]	63	46	765
261	2	804	1070	gi|486511	ORF YKR054c [Saccharomyces cerevisiae]	63	45	267
269	2	3606	1960	gi|148221	DNA-dependent ATPase, DNA helicase [Escherichia coli] pir|J50137|J50137 recQ protein - Escherichia coli	63	42	1647

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
278	8	7417	6176	gi|699773	cystathionine gamma-synthase (Mycobacterium leprae) sp|P46807|METB_MYCLE_CYSTATHIONINE GAMMA-SYNTHASE (EC 4.2.99.9) O-SUCCINYLMHOMOSERINE (THIOL)-LYASE	63	41	1242
287	2	738	1733	gi|405133	putative (Bacillus subtilis)	63	38	996
295	1	2	748	gi|1239983	hypothetical protein (Bacillus subtilis)	63	41	747
328	3	2148	3134	gi|45302	carrier protein (AA 1 - 437) (Pseudomonas aeruginosa) ic|S11497|S11497 branched-chain amino acid ti :port protein brab - eudomonas aeruginosa	63	36	987
362	2	1226	1216	sp|P35136|SERA_	D-3-PHOSPHOGLYCERATE DEHYDROGENASE (EC 1.1.1.95) (PUDH)	63	38	411
404	1	326	1051	gi|1303816	YqeZ (Bacillus subtilis)	63	35	726
405	3	2101	1715	gi|1303914	YqjY (Bacillus subtilis)	63	42	387
406	1	451	227	gi|142152	sulfate permease (gtg start codon) (Synecococcus PCC6301) pif|A30301|GRYCS7 sulfate transport protein - Synecococcus sp. PCC 7942	63	43	235
415	2	1048	2718	gi|1205402	transport ATP-binding protein (Haemophilus influenzae)	63	41	1671
426	4	3575	2679	gi|393268	29-kilodalton protein (Streptococcus pneumoniae) sp|P42362|P29K_STRPM 29 KD MEMBRANE PROTEIN IN PSAA 5'REGION ORF1	63	39	897
505	3	1347	2195	gi|1418999	orf4 (Lactobacillus sake)	63	40	849
507	1	2	574	gi|46917	comK (Bacillus subtilis, E26, Peptide, 192 aa)	63	35	573
562	2	146	1084	gi|41985	nifs-like gene (Lactobacillus delbrueckii)	63	45	919
675	1	427	215	gi|1510994	serine aminotransferase (Methanococcus jannaschii)	63	29	213
686	1	3	230	gi|517356	nitrate reductase (NAOH) (Lotus japonicus)	63	52	228
701	1	3	392	gi|881940	NorQ protein (Paracoccus denitrificans)	63	41	390
720	1	2	400	gi|47168	open reading frame (Streptomyces lividans)	63	35	399
779	1	571	287	gi|1261932	unknown (Mycobacterium tuberculosis)	63	41	285
907	1	22	321	gi|149445	ORF1 (Lactococcus lactis)	63	27	300
972	1	794	399	gi|1511235	M. jannaschii predicted coding region MJ232 (Methanococcus jannaschii)	63	27	396
1085	1	1154	618	gi|1204277	hypothetical protein (CB:U00019.14) (Haemophilus influenzae)	63	38	537
1094	1	3	542	gi|750943	urea amidolyase (Bacillus subtilis)	63	39	540
1108	1	3	482	pir|S49892|S498	regulation protein - Bacillus subtilis	63	44	480
1113	1	1231	617	gi|493017	endocarditis specific antigen (Enterococcus faecalis)	63	45	615

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	naidcb gene name	% sim	% ident	length (nt)
1300	1	3	695	[sp|P33940|YQ3H_	HYPOTHEICAL 54.3 NO PROTEIN IN ECO-ALKB INTERGENIC REGION.	63	46	693
1335	1	1	204	[gi|928989	[p100 protein (Borrelia burgdorferi)]	63	30	204
1814	1	3	245	[gi|1303914	[YqHY (Bacillus subtilis)]	63	34	243
2021	1	498	250	[pir|C33496|C334	[hlaC homolog - Bacillus subtilis]	63	46	249
2325	1	2	193	[gi|436132	[product is similar to TnpA of transposon Tn55t from Staphylococcus aureus (Clostridium butyricum)]	63	40	192
2335	1	1	195	[gi|1184298	[flagellar MS-ring protein (Borrelia burgdorferi)]	63	47	195
2406	1	451	227	[gi|1041785	[rhostry protein (Plasmodium yoelii)]	63	33	225
2961	2	136	360	[gi|312443	[carbamoyl-phosphate synthase (glutamine-hydrolysing) (Bacillus aldyoliticus)]	63	52	225
2965	1	1	402	[gi|1407784	[orf-1, novel antigen (Staphylococcus aureus)]	63	50	402
2987	1	583	293	[gi|1224069	[amidase (Moraxella catarrhalis)]	63	35	291
2994	1	266	135	[gi|836646	[phosphoribosylformalino-praie ketoisomerase (Rhodobacter phaeoideae)]	63	51	132
3041	1	440	252	[gi|1480237	[phenylacetaldehyde dehydrogenase (Escherichia coli)]	63	40	189
3078	1	609	400	[gi|1487982	[intrinsic membrane protein (Mycoplasma hominis)]	63	36	210
3139	1	2	217	[gi|439126	[glutamate synthase (NADPH) (Acetivibrio brasilense) pir|A49916|A49916	63	47	216
3625	1	793	198	[gi|623073	[Omp160; putative (Bacillus licheniformis)]	63	48	196
3658	1	1	399	[gi|1303697	[YrKA (Bacillus subtilis)]	63	37	399
3659	1	3	395	[gi|1256135	[YbbP (Bacillus subtilis)]	63	48	393
3783	1	720	361	[gi|1256902	[Pyruvate decarboxylase isozyme 2 (Swiss Prot. accession number P16467) (Saccharomyces cerevisiae)]	63	34	360
3900	1	338	171	[sp|P10537|AMYB_	[BETA-AMYLASE (EC 3.2.1.2) (1.4-ALPHA-D-GLUCAN MALTODIOLASE)]	63	54	168
4309	1	3	176	[pir|A37967|A379	[neural cell adhesion molecule Ng-CAM precursor - chicken]	63	57	174
4367	1	1	195	[gi|1321932	[Per6p gene product (Pichia pastoris)]	63	30	195
4432	1	1	312	[gi|131259	[HMG-CoA reductase (EC 1.1.1.88) (Pseudomonas nevalonii) pir|A44756|A44756	63	51	312
4468	1	6	308	[gi|296464	[ATPase (Lactococcus lactis)]	63	36	303
33	3	1411	2400	[gi|153675	[tagatase 6-P kinase (Streptococcus mutans)]	62	44	990
36	9	5985	6218	[gi|1490521	[HUSH3 (Homo sapiens)]	62	51	234

TABLE 2

5. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	Length (nt)
37	1	2	721	gi|1107531	ceuE gene product (Campylobacter coli)	62	33	720
38	15	110912	11589	gi|1222058	H. influenzae predicted coding region HIN1279 (Haemophilus influenzae)	62	38	678
38	25	119526	20329	gi|695280	ORF2 (Alcaligenes eutrophus)	62	41	804
57	2	2523	1780	gi|171234	orf1 (Haemophilus influenzae)	62	55	744
57	9	6646	6350	gi|508174	ETIB domain of PTS-dependent Gat transport and phosphorylation Escherichia coli	62	35	297
58	1	2	559	gi|755152	highly hydrophobic integral membrane protein (Bacillus subtilis) spIP42953|TAGC_BACSU TEICHOIC ACID TRANSLOCATION PERMEASE PROTEIN AGC.	62	34	558
67	10	8250	9014	gi|470683	Shows similarity with ATP-binding proteins from other ABC-transport perons. Swiss Prot Accession Numbers P24137, P08007, P04385, P24136 Escherichia coli	62	33	765
69	8	8315	7494	gi|46816	lactVA 4 gene product (Streptomyces coelicolor)	62	44	822
80	3	1793	1320	gi|33993	UDP-N-acetylmuramylalanine-D-glutamate ligase (Bacillus subtilis)	62	43	474
87	7	7034	5205	gi|217191	5'-nucleotidase precursor (Vibrio parahaemolyticus)	62	48	2172
100	3	4051	3089	gi|1511047	phosphoglycerate dehydrogenase (Methanococcus jannaschii)	62	42	963
102	1	2	520	gi|153655	mismatch repair protein (Streptococcus pneumoniae) pir[C28667|C28667 DNA mismatch repair protein hexa - Streptococcus pneumoniae	62	34	519
112	2	466	1068	gi|153741	ATP-binding protein (Streptococcus mutans)	62	37	603
114	7	6855	7562	gi|1204866	D-fucose operon activator (Haemophilus influenzae)	62	38	708
116	4	6823	5633	gi|677947	AppC (Bacillus subtilis)	62	37	1191
124	8	6855	6004	gi|853777	product similar to E.coli PRF2 protein (Bacillus subtilis) pir|555438|555438 ynfK protein - Bacillus subtilis spIP45873|HEMK_BACSU POSSIBLE PHOSPHATIDYLTRANSFERASE OXIDASE (EC 3.3.-)	62	44	852
148	1	24	554	gi|467456	unknown (Bacillus subtilis)	62	50	531
149	20	7591	6725	gi|1205807	replicative DNA helicase (Haemophilus influenzae)	62	41	867
163	1	1503	1153	gi|40067	X gene product (Bacillus sphaericus)	62	42	351
164	15	14673	15632	gi|42219	P15 gene product (AA 1 - 314) (Escherichia coli)	62	38	960
165	2	1166	1447	gi|403936	phenylalanyl-tRNA synthetase alpha subunit (Gly294 variant) unidentified cloning vector	62	38	282
166	2	2084	5089	gi|308861	CTG start codon (Lactococcus lactis)	62	43	3006
171	1	1225	614	gi|1046053	hypothetical protein (sp.P32049) (Mycoplasma genitalium)	62	41	612

TABLE 2

S. aureus - putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
193	1	2521	1310	gi|143045	hemY [Bacillus subtilis]	62	45	1212
200	1	3	956	gi|142439	ATP-dependent nuclease [Bacillus subtilis]	62	32	954
237	2	935	1966	gi|41695	hsc protein [Escherichia coli]	62	44	1032
261	3	4008	2605	gi|143121	ORF A1 putative [Bacillus firmus]	62	42	1404
299	8	4477	4719	gi|467441	expressed at the end of exponential growth under conditions in which the enzymes of the TCA cycle are repressed [Bacillus subtilis] gi|467441 expressed at the end of exponential growth under conditions in which the enzymes of the TCA cycle are repressed Bacil	62	47	243
304	6	5018	3819	gi|153015	FemA protein [Staphylococcus aureus]	62	43	1200
324	1	2	262	gi|142717	Cytochrome aa3 controlling protein [Bacillus subtilis] pir|A33960|A33960 cta protein - Bacillus subtilis sp|P12946|CTAA_BACSU CYTOCHROME AA3 CONTROLLING PROTEIN	62	30	261
325	2	269	1207	gi|581088	methionyl-tRNA formyltransferase [Escherichia coli]	62	39	939
332	6	4894	4631	gi|1499960	uridine 5'-monophosphate synthase [Methanococcus jannaschii]	62	36	264
355	1	2	370	gi|145925	[ecb [Escherichia coli]	62	32	369
365	8	6626	6804	gi|413943	[lpe-19d gene product [Bacillus subtilis]	62	54	177
369	2	2744	1626	pir|A43577|A435	regulatory protein pfor - Clostridium perfringens	62	42	1119
370	1	34	264	gi|40665	[btae-glucosidase [Clostridium thermocellum]	62	17	231
415	3	2709	3176	gi|3205401	[transport ATP-binding protein [Haemophilus influenzae]	62	35	468
429	1	1578	790	gi|1046024	[Na+ ATPase subunit J [Mycoplasma genitalium]	62	40	789
444	2	704	1369	gi|581510	[modulation gene; integral membrane protein; homology to Rhizobium leguminosarum nodi [Rhizobium loti]	62	37	666
477	2	751	1869	pir|A38440|A484	[ring-infected erythrocyte surface antigen 2, RESA-2 - Plasmodium falciparum	62	44	1119
485	1	241	1707	gi|117914	[betaine aldehyd dehydrogenase [Beta vulgaris]	62	43	1467
487	3	1141	1311	gi|149445	[ORF1 [Lactococcus lactis]	62	31	171
494	2	1134	1313	gi|166835	[ribulose biphosphate carboxylase/oxygenase activase [Arabidopsis thaliana]	62	37	180
518	1	193	882	gi|153491	[O-methyltransferase [Streptomyces glaucescens]	62	39	690
534	2	369	2522	gi|1480429	[putative transcriptional regulator [Bacillus stearothermophilus]	62	35	2154
551	6	4371	4820	gi|511113	[ferric uptake regulation protein [Campylobacter jejuni]	62	17	450
574	1	1	570	gi|153000	[enterotoxin B [Staphylococcus aureus]	62	43	570

TABLE 2

S aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
590	2	344	1171	gi|40367	ORF1 [Clostridium acetobutylicum]	62	37	828
655	1	396	830	gi|147195	pnb protein [Escherichia coli]	62	44	435
656	1	2	478	gi|1205451	cell division inhibitor [Haemophilus influenzae]	62	36	477
676	1	692	348	gi|1511613	methyl coenzyme M reductase system, component A2 [Methanococcus jannaschii]	62	36	345
687	1	493	248	gi|49272	Asparaginase [Bacillus licheniformis]	62	48	246
700	2	267	944	gi|1205822	hypothetical protein (CB:K75627_4) [Haemophilus influenzae]	62	40	678
840	2	1715	1041	gi|1045865	M. genitalium predicted coding region MG181 [Mycoplasma genitalium]	62	36	675
864	4	898	1491	gi|1144332	deoxyuridine nucleotidohydrolase [Homo sapiens]	62	38	594
916	1	35	400	gi|413931	ipa-7d gene product [Bacillus subtilis]	62	45	366
1071	1	1	771	gi|1510649	aspartokinase I [Methanococcus jannaschii]	62	40	771
1084	1	19	609	gi|688011	Agx-1 antigen [human, infertile patient, testis, peptide, 505 aa]	62	38	591
1103	1	3	203	gi|581261	ORF homologous to E.coli mcbA [Mycobacterium aurantiacus] pIR[S14030]S14030 hypothetical protein - M. aurantiacus (fragment)	62	51	201
1217	1	463	233	gi|460025	ORF2, putative [Streptococcus pneumoniae]	62	41	231
1533	1	644	414	gi|413968	ina-4td gene product [Bacillus subtilis]	62	48	231
1537	1	3	257	gi|1510641	alanyl-tRNA synthetase [Methanococcus jannaschii]	62	23	255
2287	1	3	161	gi|485956	imnC gene product [Proteus mirabilis]	62	45	159
2386	1	3	245	gi|285708	monotonic component [Clostridium botulinum]	62	31	243
2484	1	331	167	gi|142092	DNA-repair protein (recA) [Anabaena variabilis]	62	35	165
2490	1	798	400	gi|581648	lep1B gene product [Staphylococcus epidermidis]	62	42	399
3016	1	596	300	gi|710022	europorphyrinogen III [Bacillus subtilis]	62	51	297
3116	1	1	213	gi|466883	infS: B1496_C2_193 [Mycobacterium leprae]	62	44	213
3297	1	823	413	gi|475715	acetyl coenzyme A acetyltransferase [thiolase] [Clostridium acetobutylicum]	62	42	411
3609	1	31	276	gi|1408301	homologous to N-acetyl-L-amino acid amidohydrolase of Bacillus stearothermophilus [Bacillus subtilis]	62	48	246
3665	2	584	402	gi|151259	HMG-CoA reductase (EC 1.1.1.88) [Pseudomonas mevalonii] pIR[A44756]A44756 hydroxymethylglutaryl-CoA reductase (EC 1.1.1.88) [Pseudomonas sp.]	62	40	183
3733	1	3	374	gi|1353197	chlorodioxin reductase [Eubacterium acidaminophilum]	62	42	372

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
3898	1	1	237	gi|153675	legatose 6-P kinase (Streptococcus mutans)	62	45	237
4027	1	283	143	gi|330705	homologue to gene 30 (aa 1-59); putative [Bovine herpesvirus 4]	62	45	141
4109	1	727	365	gi|41748	hadh protein (AA 1-520) [Escherichia coli]	62	45	363
4303	1	1	303	gi|1303813	Yqew [Bacillus subtilis]	62	43	303
4380	1	530	267	gi|1235684	mevalonate pyrophosphate decarboxylase (Saccharomyces cerevisiae)	62	55	264
4494	1	2	256	gi|510692	enterotoxin H (Staphylococcus aureus)	62	34	255
4598	1	411	223	gi|763513	ORF4; putative [Streptomyces violaceoruber]	62	45	189
4624	1	1	222	gi|41748	hadh protein (AA 1-520) [Escherichia coli]	62	45	222
5	5	4288	3912	gi|928831	ORF5; putative [Lactococcus lactis phage BK5-7]	61	36	357
11	1	320	162	pir|C33356[C333]	prothymosin alpha homolog (clone 32) - human (fragment)	61	33	159
16	11	10991	11938	gi|1205391	hypothetical protein (SP:P3995) [Haemophilus influenzae]	61	44	948
32	1	281	801	gi|1066504	exo-beta 1,3 glucanase [Cochliobolus carbonum]	61	50	519
38	3	616	1107	gi|1510864	glutamine transport ATP-binding protein Q [Methanococcus jannaschii]	61	41	492
45	4	3082	4038	gi|1109686	ProX [Bacillus subtilis]	61	45	957
48	8	7118	7504	gi|498839	ORF2 [Clostridium perfringens]	61	33	387
51	9	4605	5570	gi|380269	traC [plasmid pAD1]	61	42	966
60	6	1689	2243	gi|1205893	hypothetical protein (CB:U00011_3) [Haemophilus influenzae]	61	32	555
62	9	5559	5122	gi|854656	[Na/H antiporter system ORF2 (Bacillus alcalophilus)]	61	38	438
67	5	4330	5646	gi|466612	lnkA [Escherichia coli]	61	36	1317
74	2	2400	1504	gi|1204846	[carbonate kinase (Haemophilus influenzae)]	61	40	897
85	3	2198	1103	gi|1498756	[amidophosphoribosyltransferase PurF (Rhizobium etli)]	61	41	1098
86	4	1995	1582	gi|149931	[M. jannaschii predicted coding region M31083] [Methanococcus jannaschii]	61	44	414
97	1	74	649	gi|1518679	orf [Bacillus subtilis]	61	44	576
99	2	2454	1990	gi|413958	[ipa-34d gene product (Bacillus subtilis)]	61	18	465
124	7	6223	5123	gi|556881	[similar to Saccharomyces cerevisiae SUA5 protein (Bacillus subtilis)] pir|549358|549358 ipc-29d protein - Bacillus subtilis sp|p39153|YMLC_BACSU HYPOTHETICAL 37.0 KD PROTEIN IN SPOIIR-GLYC INTERGENIC REGION.	61	46	1101
125	4	1668	2531	gi|1491643	[ORF4 gene product (Chloroflexus aurantiacus)]	61	43	864

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	blast gene name	% sim	% ident	length (nt)
132	1	1250	627	gi|120259|P002	hypothetical protein 1 - Enterococcus faecalis plasmid pAM-beta-1 (fragment)	61	43	624
149	9	3617	3075	gi|1144332	deoxyuridine nucleotidohydrolase (Homo sapiens)	61	40	543
149	22	8690	7869	gi|160047	p101/acidic basic repeat antigen [Plasmodium falciparum] p101/acidic basic repeat antigen precursor - Plasmodium falciparum (strain Camp)	61	35	822
168	3	1915	2361	gi|1499694	HIT protein, member of the HIT-family [Methanococcus jannaschii]	61	41	447
171	9	9675	7948	gi|467436	similar to SpoVB [Bacillus subtilis]	61	38	1728
174	3	1042	2340	gi|216374	glutaryl 7-ACA acylase precursor [Bacillus laterosporus]	61	49	1299
190	4	5034	4111	gi|409286	bmrU [Bacillus subtilis]	61	37	924
216	1	2	190	gi|415861	eukaryotic initiation factor 2 beta (eIF-2 beta) [Cryptosporidium parvum]	61	29	189
227	7	4161	5048	gi|216341	ORF for methionine amino peptidase [Bacillus subtilis]	61	41	888
238	4	1959	3047	gi|405543	CbrC protein [Erwinia chrysanthemi]	61	38	1089
247	1	2	694	gi|537231	ORF_1579 [Escherichia coli]	61	38	693
247	2	678	1034	gi|142226	chvD protein [Agrobacterium tumefaciens]	61	40	357
257	2	3523	2627	gi|69379	glvF-1 protein [Mycobacterium leprae]	61	40	897
268	2	3419	3051	gi|40364	ORF41 [Clostridium acetobutylicum]	61	41	369
275	4	4621	4827	gi|1204868	hypothetical protein (GP:M87049_57) [Haemophilus influenzae]	61	36	207
277	1	1	1845	gi|794897	beta-N-acetylhexosaminidase [Streptococcus pneumoniae] p1r[A56390]A56390 mannosyl-glycoprotein ndo-beta-N-acetylglucosaminidase (EC 3.2.1.96) precursor - streptococcus pneumoniae	61	45	1845
278	9	8003	7032	gi|467462	cysteine synthetase A [Bacillus subtilis]	61	43	972
278	10	9878	8535	gi|1205919	Na+ and Cl- dependent gamma-aminobutyric acid transporter [Haemophilus influenzae]	61	38	1344
283	1	1	366	gi|755607	polyA polymerase [Bacillus subtilis]	61	36	366
288	2	1918	1496	gi|388108	cell wall enzyme [Enterococcus faecalis]	61	43	423
291	1	86	334	gi|454265	FBP3 [Petunia hybrida]	61	38	249
318	1	1104	694	gi|290531	similar to beta-glucoside transport protein [Escherichia coli] sp|P31451|PTB_ECOLI PTS SYSTEM, ARBUTIN-LIKE IIB COMPONENT PHOSPHOTRANSFERASE ENZYME II, B COMPONENT (EC 2.7.1.69)	61	47	411
330	2	1912	1190	gi|1001805	hypothetical protein [Synchocystis sp.]	61	41	723

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
385	2	1513	1025	gi|533098	DnaD protein [Bacillus subtilis]	61	42	489
426	1	794	399	gi|1303853	YqoF [Bacillus subtilis]	61	46	396
438	3	810	1421	gi|1293660	AbaA2 [Streptomyces coelicolor]	61	36	612
454	1	1580	792	gi|733522	phosphatidylinositol-4,5-diphosphate 3-kinase [Dictyostelium discoideum]	61	30	789
464	2	784	560	gi|1123120	ICS187.5 gene product [Caenorhabditis elegans]	61	38	225
470	8	6077	7357	gi|623073	ORF360; putative [Bacteriophage LL-H]	61	47	1281
509	1	554	279	gi|467484	unknown [Bacillus subtilis]	61	45	276
555	3	1916	1296	gi|141800	anthranilate synthase glutamine amidotransferase [Acinetobacter alcoaceticus]	61	42	621
569	1	1711	857	gi|467090	B2235_C2_195 [Mycobacterium leprae]	61	47	855
595	2	961	803	sp|P36686|SURE_	SURVIVAL PROTEIN SURE HOMOLOG (FRAGMENT)	61	33	159
592	3	1694	1422	gi|11221602	immunity repressor protein [Haemophilus influenzae]	61	32	273
603	1	43	357	gi|507728	Ilmp [Vibrio parahaemolyticus]	61	33	315
669	1	2467	1235	gi|1146243	22.4% identity with Escherichia coli DNA-damage inducible protein ...; putative [Bacillus subtilis]	61	37	1233
675	3	805	1101	gi|403373	glycerophosphoryl diester phosphodiesterase [Bacillus subtilis]; pir|S37231|S37251 glycerophosphoryl diester phosphodiesterase - subtilis	61	36	297
703	1	1656	829	gi|537181	ORF_4470 [Escherichia coli]	61	32	828
728	1	1628	816	gi|806281	DNA polymerase I [Bacillus stearothermophilus]	61	39	813
821	1	61	318	gi|709992	hypothetical protein [Bacillus subtilis]	61	38	258
856	2	2313	1567	gi|609310	portal protein gp3 [Bacteriophage HK97]	61	40	747
973	1	1081	542	gi|143213	putative [Bacillus subtilis]	61	38	540
1124	1	59	370	gi|1107541	C33D9.8 [Caenorhabditis elegans]	61	26	312
1492	1	548	276	gi|406397	unknown [Mycoplasma genitalium]	61	32	273
1602	1	46	318	gi|733522	phosphatidylinositol-4,5-diphosphate 3-kinase [Dictyostelium discoideum]	61	34	273
2500	1	577	280	gi|1045964	hypothetical protein (CB:U14001.297) [Mycoplasma genitalium]	61	31	288
2968	1	2	808	gi|397526	clumping factor [Staphylococcus aureus]	61	55	807
3076	1	3	248	gi|149373	ORF 1 [Lactococcus lactis]	61	41	246

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
3609	2	207	401	gi|1408501	homologous to N-acyl-L-amino acid amidohydrolase of <i>Bacillus stearothermophilus</i> [Bacillus subtilis]	61	39	195
3662	1	1477	740	gi|1303813	yqew [Bacillus subtilis]	61	42	738
3672	1	2	442	gi|784897	beta-N-acetylhexosaminidase (Streptococcus pneumoniae) pir[A56390]A56390 mannosyl-glycoprotein ndo-beta-N-acetylglucosaminidase (EC 3.2.1.96) precursor - treptococcus pneumoniae	61	50	441
3724	1	2	220	gi|1009366	Respiratory nitrate reductase [Bacillus subtilis]	61	41	219
3728	1	3	398	gi|677943	AppD [Bacillus subtilis]	61	46	396
3884	1	3	401	gi|784897	beta-N-acetylhexosaminidase [Streptococcus pneumoniae] pir[A56390]A56390 mannosyl-glycoprotein ndo-beta-N-acetylglucosaminidase (EC 3.2.1.96) precursor - treptococcus pneumoniae	61	47	399
3971	1	3	383	gi|784897	beta-N-acetylhexosaminidase [Streptococcus pneumoniae] pir[A56390]A56390 mannosyl-glycoprotein ndo-beta-N-acetylglucosaminidase (EC 3.2.1.96) precursor - treptococcus pneumoniae	61	45	381
4038	1	661	359	gi|133997n	large subunit of NAM-dependent glutamate synthase [Plectonema boryanum]	61	24	303
4041	1	546	274	gi|413953	lsm-29d gene product [Bacillus subtilis]	61	48	273
4047	1	1	402	gi|528991	unknown [Bacillus subtilis]	61	42	402
4102	1	1	345	gi|976025	HraA [Escherichia coli]	61	46	345
4155	1	1	336	gi|784897	beta-N-acetylhexosaminidase [Streptococcus pneumoniae] pir[A56390]A56390 mannosyl-glycoprotein ndo-beta-N-acetylglucosaminidase (EC 3.2.1.96) precursor - treptococcus pneumoniae	61	50	336
4268	1	463	233	gi|450688	hscM gene of EcoBpr1 gene product [Escherichia coli] pir[S38437]S38437 hadM protein - Escherichia coli pir[S09629]S09629 hypothetical protein A - Escherichia coli (SUB 40-520)	61	38	231
4374	1	542	273	gi|784897	beta-N-acetylhexosaminidase [Streptococcus pneumoniae] pir[A56390]A56390 mannosyl-glycoprotein ndo-beta-N-acetylglucosaminidase (EC 3.2.1.96) precursor - treptococcus pneumoniae	61	50	270
4389	1	2	172	gi|147516	ribokinase [Escherichia coli]	61	35	171
4621	1	2	268	gi|784897	beta-N-acetylhexosaminidase [Streptococcus pneumoniae] pir[A56390]A56390 mannosyl-glycoprotein ndo-beta-N-acetylglucosaminidase (EC 3.2.1.96) precursor - treptococcus pneumoniae	61	47	267
4663	1	27	227	gi|976025	HraA [Escherichia coli]	61	50	201
4	6	663	5536	gi|1408501	homologous to N-acyl-L-amino acid amidohydrolase of <i>Bacillus stearothermophilus</i> [Bacillus subtilis]	60	43	1128

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
11	6	3426	3725	gi1410748	ring-infected erythrocyte surface antigen (plasmidium falciptarum) pIR/A25536/A25526 ring-infected erythrocyte surface antigen recursor - plasmidium falciptarum (strain FC37/Papua New Guinea) sp|P13030|RESA_PLAFF RING-INFECTED ERYTHROCYTE SURFACE ANTIGEN RE	60	24	300
11	14	11035	10313	gi11217651	carboxyl reductase (NADPH) (Rattus norvegicus)	60	28	723
16	12	11917	12930	gi11001453	hypothetical protein (Synecocystis sp.)	60	37	1014
33	1	26	469	gi1388109	regulatory protein (Enterococcus faecalis)	60	41	444
37	13	10914	9834	gi11336656	Orf1 (Bacillus subtilis)	60	40	981
39	4	4364	4522	gi14872	ORF 4 (Saccharomyces kluyveri)	60	47	159
41	1	2047	1025	gi1142822	D-alanine racemase cds (Bacillus subtilis)	60	39	1023
43	4	2474	3607	gi1468046	para-nitrobenzyl esterase (Bacillus subtilis)	60	40	1134
44	10	6756	7769	gi1414234	lchIF (Escherichia coli)	60	52	1014
45	10	8874	9074	gi1343949	var1(40.0) (Saccharomyces cerevisiae)	60	44	201
56	118	27842	26430	gi1468784	lancR gene product (Rhizobium meliloti)	60	35	1413
60	2	173	388	gi1303864	YqgQ (Bacillus subtilis)	60	33	216
63	2	357	1619	gi1467134	lureD: B229_C3_234 (Mycobacterium leprae)	60	43	1263
69	1	787	395	gi11518853	lOsaA (Salmonella typhimurium)	60	36	193
88	1	1	1188	gi11480429	putative transcriptional regulator (Bacillus stearothermophilus)	60	30	1188
92	6	4735	3881	gi1349227	transmembrane protein (Escherichia coli)	60	37	855
92	7	5996	4923	gi1466613	lOlaB (Escherichia coli)	60	38	1074
93	1	949	476	gi11510925	coenzyme F420-reducing hydrogenase, beta subunit (Methanococcus jannaschii)	60	27	474
96	6	7166	7578	gi1492715	laccase IV protein (Klebsiella pneumoniae)	60	30	213
98	6	3212	4069	gi1467425	unknown (Bacillus subtilis)	60	42	856
102	10	7158	7430	gi1141092	acetolactate synthase small subunit (Bacillus subtilis) sp|P13752|ILV_N_BACSU ACETOLACTATE SYNTHASE SMALL SUBUNIT (EC 1.3.18) (AIAS) (ACETOHYDROXY-ACID SYNTHASE SMALL SUBUNIT) (ALS).	60	37	273
109	11	9127	10515	gi11255259	lO-succinylbenzoic acid (OSB) CoA ligase (Staphylococcus aureus)	60	28	1389
109	12	10499	11656	gi1141954	beta-ketothiolase (Alcaligenes eutrophus)	60	41	1156
119	2	4630	3134	gi11524280	unknown (Mycobacterium tuberculosis)	60	45	1497

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
121	9	6957	7646	gi11107529	leuc gene product [Campylobacter coli]	60	35	690
140	7	7704	6013	gi1146547	kdpA [Escherichia coli]	60	45	1692
145	1	2	703	gi11460077	unknown [Mycobacterium tuberculosis]	60	23	702
150	3	2809	2216	gi1146230	putative [Bacillus subtilis]	60	40	594
157	2	1389	961	gi11303975	VqjX [Bacillus subtilis]	60	30	429
158	5	5125	4769	gi11449288	unknown [Mycobacterium tuberculosis]	60	36	357
159	1	511	257	gi1580912	murD gene product [Bacillus subtilis]	60	43	255
160	1	159	1187	gi11204532	hypothetical protein (GB:LI9201_29) [Haemophilus influenzae]	60	34	1029
161	14	4249	7866	gi11496003	ORF3: Putative oligopeptidase based on homology with Lactococcus lactis PepF (GenBank Accession Number 232522) [Caldicellulosiruptor saccharolyticus]	60	34	384
172	3	1331	2110	gi1485280	28.2 kDa protein [Streptococcus pneumoniae]	60	33	780
173	2	4042	2460	gi11524397	glycine betaine transporter OpuD [Bacillus subtilis]	60	41	1623
173	4	5963	4953	gi11100737	NAUP dependent leukotoxin b4 12-hydroxydehydrogenase [Sus scrofa]	60	44	1011
198	1	3	995	gi1413943	lpa-19d gene product [Bacillus subtilis]	60	42	993
201	4	3641	4573	ep137028|YADT_	HYPOTHETICAL 29.4 KD PROTEIN IN HEMU-PPS INTERGENIC REGION PRECURSOR.	60	37	933
201	3	3269	2415	gi1927798	10719_34p; CAI: 0.14 [Saccharomyces cerevisiae]	60	43	855
206	9	12234	12515	ep137347|YECU_	HYPOTHETICAL 21.8 KD PROTEIN IN ASP5 5'REGION.	60	47	282
212	4	1213	1410	gi1332711	hemagglutinin-neuraminidase fusion protein [Human parainfluenza virus 3]	60	34	198
214	1	65	1153	gi11204366	hypothetical protein (GB:U14003_130) [Haemophilus influenzae]	60	36	1089
237	1	2	937	gi1149377	WISD [Lactococcus lactis]	60	40	936
241	6	5696	4998	gi11046160	hypothetical protein (GB:U00021_5) [Mycoplasma genitalium]	60	37	699
260	6	5919	6485	gi1431950	similar to a B. subtilis gene (GB: BACHEMY_5) [Clostridium astreum]	60	35	567
264	1	2432	1218	gi1397526	clumping factor [Staphylococcus aureus]	60	53	1215
267	1	3	1409	gi1148316	NaN-antiporter protein [Enterococcus hirae]	60	27	1407
275	3	3804	4595	pir|FJ6889|F368	leuD 3'-region hypothetical protein - Lactococcus lactis subsp. lactis (strain IL1403)	60	35	792
291	3	860	1198	gi11208889	coded for by C. elegans cDNA yk130e12.5; contains C2H2-type zinc fingers [Caenorhabditis elegans]	60	33	339

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
307	6	3421	3176	gi11070014	protein-dependent [Bacillus subtilis]	60	36	246
316	8	4957	5823	gi1411952	lpa-28d gene product [Bacillus subtilis]	60	41	867
328	4	2996	3484	gi11204484	membrane-associated component, branched amino acid transport system [Haemophilus influenzae]	60	39	489
332	5	4887	4363	gi11205449	colicin V production protein (pur regulon) [Haemophilus influenzae]	60	37	525
357	1	1062	532	gi1487842	single-stranded DNA-specific exonuclease [Escherichia coli]	60	41	531
375	2	96	362	gi116057	adenylyl cyclase gene product [Saccharomyces kluyveri] rj201145[OYBYK adenylate cyclase (EC 4.6.1.1) - yeast ccharomyces kluyveri]	60	47	267
397	1	66	416	gi1709999	glucuronate dehydratase [Bacillus subtilis]	60	37	351
409	1	2	163	gi1499700	glycogen phosphorylase [Saccharomyces cerevisiae]	60	35	162
453	4	914	1237	gi11196899	unknown protein [Staphylococcus aureus]	60	36	324
453	7	3838	3620	sp|P12222|VCFL_HYPOTHETICAL 228 KD PROTEIN (ORF 1901)		60	31	219
470	2	622	945	gi130782|S107	integrin homolog - yeast [Saccharomyces cerevisiae]	60	31	324
500	1	118	606	gi1467407	unknown [Bacillus subtilis]	60	36	489
503	3	752	982	gi1167835	myosin heavy chain I Dictyostelium discoideum	60	34	231
505	4	2238	3563	gi11510732	NADH oxidase [Methanococcus jannaschii]	60	26	1326
523	1	3	1043	gi1143331	alkaline phosphatase regulatory protein [Bacillus subtilis] p1r|A27650|A27650 regulatory protein phoR - Bacillus subtilis sp|P23345|PHOR_BACSU ALKALINE PHOSPHATASE SYNTHESIS SENSOR PROTEIN INOR (EC 2.7.3.-)	60	41	1041
543	1	1	465	gi11511103	cobalt transport ATP-binding protein O [Methanococcus jannaschii]	60	40	465
545	1	1	726	gi11498192	putative [Pseudomonas aeruginosa]	60	40	726
556	1	2	1034	gi11477402	ltx gene product [Bordetella pertussis]	60	42	1033
578	1	974	489	gi11205129	H. influenzae predicted coding region H10882 [Haemophilus influenzae]	60	42	486
594	1	1	624	gi11212755	adenylyl cyclase [Aeromonas hydrophila]	60	45	624
604	1	3	530	gi1145925	[fecB [Escherichia coli]	60	42	528
620	1	926	465	gi11205483	bicyclicacyl resistance protein [Haemophilus influenzae]	60	33	462
630	2	871	1122	gi11486242	unknown [Bacillus subtilis]	60	41	252
645	2	574	425	gi11205136	serine hydroxymethyltransferase [serine methylase] [Haemophilus influenzae]	60	28	150

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
684	1	1082	843	[gi|1205538	hypothetical protein (G8:U14003_302) (Haemophilus influenzae)	60	39	240
786	1	967	485	[gi|1402944	lorRM1 gene product (Bacillus subtilis)	60	46	483
844	1	588	346	[gi|730943	urea amidolyase (Bacillus subtilis)	60	40	243
851	1	1	726	[gi|159661	GMP reductase (Ascaris lumbricoides)	60	41	726
871	1	1746	874	[gi|1001493	hypothetical protein (Synecocystis sp.)	60	39	873
896	1	1558	839	[gi|604926	NADH dehydrogenase, subunit 5 (Schizosaccharomyces pombe) [P50168] NUSK_SCHCO	60	39	720
908	2	448	753	[gi|628880	novel hemolytic factor (Bacillus cereus)	60	31	306
979	1	2	595	[gi|1429255	putative: orf1 (Bacillus subtilis)	60	30	594
1078	1	669	502	[gi|581055	inner membrane copper tolerance protein (Escherichia coli) [gi|871029	60	40	168
1112	1	1150	620	[gi|407885	diaphorase like protein (Escherichia coli) [gi|847295] S47295	60	34	531
1135	1	484	275	[gi|1171407	inner membrane copper tolerance protein - scherichia coli	60	36	210
1146	1	17	562	[gi|1239981	ORF3 (Streptomyces griseus)	60	36	546
1291	1	716	360	[gi|857530] S575	hypothetical protein (Bacillus subtilis)	60	30	357
1332	1	336	169	[gi|1222056	carboxyl esterase - Acinetobacter calcoaceticus	60	44	168
1429	1	3	146	[gi|1205619	aminotransferase (Haemophilus influenzae)	60	39	144
1722	1	570	286	[gi|240052	ferritin like protein (Haemophilus influenzae)	60	36	285
2350	1	385	200	[gi|497626	dihydroflavonol-4-reductase, DFR (Hordeum vulgare-barley, cv. Gula, eptide, 354 aa)	60	20	186
2816	1	519	310	[gi|508981	ORF 1 (Plasmid pAQ1)	60	48	210
3027	1	568	302	[gi|1146199	prephenate dehydratase (Bacillus subtilis)	60	37	267
3084	1	20	208	[gi|1407784	putative (Bacillus subtilis)	60	51	189
3155	1	2	226	[gi|1046097	orf-1, novel antigen (Staphylococcus aureus)	60	34	225
3603	1	368	186	[gi|510108	cytadherence-accessory protein (Mycoplasma genitalium)	60	42	183
3665	1	486	244	[gi|151259	mitochondrial long-chain enoyl-CoA hydratase/3-hydroxycyl-CoA dehydrogenase	60	42	243
3747	1	3	146	[gi|474192	alpha-subunit (Rattus norvegicus)	60	36	144
					HM-CoA reductase (EC 1.1.1.88) (Pseudomonas nevaloni) [gi|A44756] A44756			
					hydroxymethylglutaryl-CoA reductase (EC 1.1.1.88) Pseudomonas sp.			
					lucC gene product (Escherichia coli)			

TABLE 2

S aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
3912	1	3	335	gi|488695	novel antigen: orf-2 (Staphylococcus aureus)	60	44	333
4072	1	3	272	gi|405879	yeiH (Escherichia coli)	60	33	270
4134	1	510	352	gi|780656	chemoreceptor protein (Rhizobium leguminosarum bv. viciae) gi|780656	60	28	159
4207	2	677	402	gi|602031	similar to trimethylamine DM (Mycoplasma capricolum) pir[S49550/S49550] (SGC3) (fragment)	60	41	276
4243	1	127	324	gi|899317	peptide synthetase module (Microcystis aeruginosa) pir[S49111/S49111] (SUB 144-528)	60	42	198
4310	1	624	313	gi|508980	phcB (Bacillus subtilis)	60	28	312
4345	1	363	173	gi|510108	mitochondrial long-chain enoyl-CoA hydratase/3-hydroxycyl-CoA ehydrogenase alpha-subunit (Rattus norvegicus)	60	42	171
4382	1	498	280	gi|47382	acyl-CoA-dehydrogenase (Streptomyces purpurascens)	60	48	219
4474	1	53	223	gi|510108	mitochondrial long-chain enoyl-CoA hydratase/3-hydroxycyl-CoA ehydrogenase alpha-subunit (Rattus norvegicus)	60	42	171
23	4	4518	3523	gi|426446	VipB protein (Salmonella typhi)	59	39	996
33	2	707	1403	gi|548604/S486	hypothetical protein - Mycoplasma capricolum (SGC3) (fragment)	59	33	777
33	5	4651	5853	gi|6721	PS982.3 (Caenorhabditis elegans)	59	33	1203
17	2	3228	2299	gi|42833	ORF2 (Bacillus subtilis)	59	37	910
38	21	16784	16593	gi|912576	hIP (Phaeodactylum tricornutum)	59	40	192
52	3	2648	2349	gi|536972	ORF_090a (Escherichia coli)	59	44	300
54	12	14181	13402	gi|483940	transcription regulator (Bacillus subtilis)	59	37	780
57	3	4397	3339	gi|508176	Gat-1-P-DM, NAD dependent (Escherichia coli)	59	40	1059
66	1	986	495	gi|1303901	YqjH (Bacillus subtilis)	59	34	492
67	7	6552	7460	gi|912461	IntK (Escherichia coli)	59	37	909
70	7	5383	6366	gi|1399822	PhoD precursor (Rhizobium meliloti)	59	46	984
78	1	1	1449	gi|571145	unknown, similar to S.coli cardiolipin synthase (Bacillus subtilis) sp|P45860|WIE_BACSU HYPOHETICAL 58.2 PROTEIN IN NARI-ACDA HYDROGENIC REGION.	59	39	1449
82	10	14329	15534	gi|490328	LORP F (unidentified)	59	44	1206

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
89	2	1602	958	gi1642801	unknown [Saccharomyces cerevisiae]	59	32	645
96	4	4940	5473	gi11333802	protein of unknown function [Rhodobacter capsulatus]	59	31	534
98	1	2	820	gi1467421	similar to B. subtilis DnaM [Bacillus subtilis]	59	34	819
119	1	166	1557	gi1143122	ORF B; putative [Bacillus firmus]	59	36	1392
120	10	6214	6756	gi115354	ORF 55.9 [Bacteriophage T4]	59	39	543
120	16	12476	13510	gi11086575	Beta [Rhizobium meliloti]	59	44	1035
123	1	386	195	gi1984737	catalase [Campylobacter jejuni]	59	38	192
130	1	370	645	gi11256634	25.8% identity over 120 aa with the Synecoccus sp. MpaV protein; putative [Bacillus subtilis]	59	31	276
131	4	5278	5712	gi11510655	hypothetical protein (SP:P42297) [Methanococcus jannaschii]	59	39	435
164	1	3	509	gi11001342	hypothetical protein [Synecocystia sp.]	59	41	507
164	4	1529	2821	gi11205165	hypothetical protein (SP:P7764) [Haemophilus influenzae]	59	35	1293
164	19	19643	21376	gi11001381	hypothetical protein [Synecocystia sp.]	59	34	1734
173	3	4727	3717	gi11184121	leuxin-induced protein [Vigna radiata]	59	50	1011
179	2	2218	1688	gi1143036	unidentified gene product [Bacillus subtilis]	59	33	531
195	12	12669	11503	gi1762778	NIFS gene product [Anabaena azollae]	59	41	1167
201	5	4702	5670	gi11510240	hemin permease [Methanococcus jannaschii]	59	32	969
201	7	5719	6315	gi11511456	M. jannaschii predicted coding region M31437 [Methanococcus jannaschii]	59	34	597
209	1	102	461	gi11204666	hypothetical protein (GB:X73124.53) [Haemophilus influenzae]	59	42	360
214	3	1050	2234	gi11515331	12-nitropropane dioxygenase [Williopsis setacea]	59	36	1185
214	5	3291	4135	gi11303709	YrkJ [Bacillus subtilis]	59	32	843
217	2	3381	2167	gi1290489	ldp (CG Site No. 18430) [Escherichia coli]	59	44	1215
237	5	3078	3785	gi1149382	IIIa [Lactococcus lactis]	59	38	708
251	2	376	960	gi11303791	YqjJ [Bacillus subtilis]	59	34	585
286	1	1621	812	gi1146551	transmembrane protein (kdp) [Escherichia coli]	59	31	810
316	5	4978	3860	gi1405879	YehH [Escherichia coli]	59	32	1119
370	3	600	761	gi11303794	Yqem [Bacillus subtilis]	59	35	162

TABLE 2

S. aureus - putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
382	1	1009	506	gi|547513	orf3 (Haemophilus influenzae)	59	34	504
391	3	1620	1273	gi|152901	ORF 3 (Spirochaeta aurantia)	59	37	348
406	3	2805	1705	gi|709992	hypothetical protein (Bacillus subtilis)	59	34	1101
426	5	3802	3245	gi|1204610	iron(III) diclrate transport ATP-binding protein PECE (Haemophilus influenzae)	59	36	558
429	2	1513	1148	gi|1064809	homologous to sp-WTBA_ECOLI (Bacillus subtilis)	59	42	366
460	2	708	1301	gi|466882	ppst: B1496_C2_189 (Mycobacterium leprae)	59	37	594
461	4	2212	3135	gi|1498295	homoserine kinase homolog (Streptococcus pneumoniae)	59	37	924
473	1	2929	1607	gi|147989	trigger factor (Escherichia coli)	59	40	1323
480	8	5862	6110	gi|1205311	(3R)-hydroxymyristol acyl carrier protein dehydrase (Haemophilus influenzae)	59	40	249
521	1	14	1354	pir|A25620|A256	staphylocoagulase - Staphylococcus aureus (fragment)	59	32	1341
534	4	2994	4073	gi|153746	mannitol-phosphate dehydrogenase (Streptococcus mutans) pir|C44798|C44798	59	36	1080
535	1	1	954	gi|1469939	mannitol-phosphate dehydrogenase MJD - Treptococcus mutans	59	33	954
551	3	2836	3186	gi|1204511	group B oligopeptidase PcpB (Streptococcus agalactiae)	59	45	351
573	2	449	940	gi|386681	bacterioferritin comigratory protein (Haemophilus influenzae)	59	36	492
650	1	5	748	gi|396400	ORF YAL022 (Saccharomyces cerevisiae)	59	30	744
664	1	566	285	gi|1262748	similar to eukaryotic Na/Hs exchangers (Escherichia coli) sp|P33703|YJCE_ECOLI HYPOTHETICAL 60.5 KD PROTEIN IN SOKR-ACS NTERGENIC REGION (O349)	59	33	282
670	1	3	455	gi|1122758	LukP-PV like component (Staphylococcus aureus)	59	42	453
674	3	543	929	gi|293033	unknown (Bacillus subtilis)	59	46	387
758	1	349	176	gi|1500472	integrase (Bacteriophage phi-LC3)	59	37	174
771	2	2270	1461	gi|522150	M. jannaachii predicted coding region M1577 (Methanococcus jannaachii)	59	44	810
825	1	2191	1097	gi|397526	bromoperoxidase BPO-A1 (Streptomyces aureofaciens) sp|P33912|BPA1_STRAU NON-HAEM BROMOPEROXIDASE BPO-A1 (EC 1.11.1.-) BROMIDE PEROXIDASE (BPO1) (SUB 2-275)	59	47	1095
1052	2	1094	723	gi|289262	clumping factor (Staphylococcus aureus)	59	36	372
1152	1	373	188	gi|1276668	conE ORF3 (Bacillus subtilis)	59	37	186
					ORF238 gene product (Porphyra purpurea)	59	37	186

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
1198	1	492	247	gi142439	ATP-dependent nuclease [Bacillus subtilis]	59	26	246
1441	1	468	235	gi1045942	glycyl-tRNA synthetase [Mycoplasma genitalium]	59	37	234
2103	1	1	186	gi1459250	triacylglycerol lipase [Galactomyces geotrichum]	59	33	186
2205	1	793	398	gi1303794	Vqem [Bacillus subtilis]	59	38	396
2578	1	484	284	gi1258003	insulin-like growth factor binding protein complex acid-labile subunit [rats, liver, Peptide, 603 aa]	59	48	201
2967	2	145	348	gi1212730	Vqhk [Bacillus subtilis]	59	44	204
3012	1	3	248	gi173571	neurofilament protein NF70 [Helix asperae]	59	31	246
3544	1	3	401	gi1055218	crotonase [Clostridium acetobutylicum]	59	42	399
3548	1	3	401	gi1055218	crotonase [Clostridium acetobutylicum]	59	42	399
3580	1	698	351	gi1055218	crotonase [Clostridium acetobutylicum]	59	42	348
3720	1	722	363	gi1408494	homologous to penicillin acylase [Bacillus subtilis]	59	36	360
4171	1	3	296	gi1055218	crotonase [Clostridium acetobutylicum]	59	42	294
4305	1	618	310	gi13524193	unknown [Mycobacterium tuberculosis]	59	39	309
18	1	1242	622	gi146913	N-acetylglucosamine transport protein [Escherichia coli] pir|829895|MOEC2N phosphotransferase system enzyme II (EC 7.1.69). N-acetylglucosamine-specific - Escherichia coli gp|P09323|PTAA_ECOLI PTS SYSTEM, N-ACETYLGLUCOSAMINE-SPECIFIC IIABC COMPONENT (EIIA)	58	43	621
20	7	7020	5845	gi150502	collagen alpha chain precursor (AA -27 to 1127) [Mus musculus]	58	50	1176
21	5	3234	3626	gi1054860	phosphoribosyl anthranilate isomerase [Thermotoga maritima]	58	32	393
23	2	2841	1669	gi1276880	EpsG [Streptococcus thermophilus]	58	29	1173
23	10	9301	8090	gi131133|A311	diaminopimelate decarboxylase (EC 4.1.1.20) - Pseudomonas aeruginosa	58	37	1212
38	29	22555	22884	gi1973249	yeast tRNA reductase [Medicago sativa]	58	37	330
44	1	2	406	gi1289272	ferriochrome-binding protein [Bacillus subtilis]	58	33	405
45	1	1	552	gi129464	embryonic myosin heavy chain (1085 AA) [Homo sapiens] tr|S12460|S12460 myosin beta heavy chain - human	58	33	552
55	2	759	538	gi1158852	glucose regulated protein [Echinococcus multilocularis]	58	32	222
62	13	8493	8068	gi1975353	kinase-associated protein B [Bacillus subtilis]	58	35	426
63	3	1553	1717	gi166926	[Arabidopsis thaliana unidentified mRNA sequence, complete cds.], ene product [Arabidopsis thaliana]	58	35	165

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
67	13	12017	11229	gi|1228083	NADH dehydrogenase subunit 2 [Chorthippus parallelus]	58	41	789
96	8	8208	9167	gi|709992	hypothetical protein [Bacillus subtilis]	58	42	960
107	2	2065	1364	gi|806327	Escherichia coli hrpA gene for A protein similar to yeast Prp16 and Rf22 [Escherichia coli]	58	37	702
112	7	4519	5613	gi|155588	glucose-fructose oxidoreductase [Zymomonas mobilis] pir|A42289|A42289 glucose-fructose oxidoreductase (EC 1.1.1.-) recursor - Zymomonas mobilis	58	38	1095
114	6	7318	6503	gi|1377843	unknown [Bacillus subtilis]	58	38	816
143	2	2261	1395	pir|A45605|A456	mature-parasite-infected erythrocyte surface antigen MESA - Plasmodium falciparum	58	31	867
151	2	717	950	gi|1370261	unknown [Mycobacterium tuberculosis]	58	31	234
154	6	6015	4627	gi|1209277	pCtHsa1 gene product [Chlamydia trachomatis]	58	41	1389
154	16	14281	13541	gi|146613	DNA ligase (EC 6.5.1.2) [Escherichia coli]	58	39	741
155	3	2269	1892	gi|1303917	YqjB [Bacillus subtilis]	58	34	378
174	1	1056	539	gi|904198	hypothetical protein [Bacillus subtilis]	58	26	528
189	4	1533	1769	gi|467383	DNA binding protein (probable) [Bacillus subtilis]	58	25	237
201	3	2669	3307	gi|1511453	endonuclease III [Methanococcus jannaschii]	58	34	639
208	1	2	238	gi|1276729	phycobilisome linker polypeptide [Porphyra purpurea]	58	29	237
220	11	14575	13058	gi|197526	clumping factor [Staphylococcus aureus]	58	51	1518
231	3	1629	1474	gi|1002520	HutS [Bacillus subtilis]	58	45	156
233	6	4201	3497	gi|1463023	No definition line found [Caenorhabditis elegans]	58	39	705
243	10	9303	10082	gi|537207	ORF_f277 [Escherichia coli]	58	32	780
257	1	331	1143	gi|1340128	ORF1 [Staphylococcus aureus]	58	44	813
302	2	460	801	gi|40174	ORF X [Bacillus subtilis]	58	34	342
307	31	6984	6127	gi|1303842	YnfU [Bacillus subtilis]	58	30	858
321	3	1914	2747	gi|1219996	hypothetical protein [Bacillus subtilis]	58	41	834
342	4	2724	3497	gi|454838	ORF 6; putative [Pseudomonas aeruginosa]	58	41	774
348	1	1	663	gi|467478	unknown [Bacillus subtilis]	58	36	663
401	2	384	605	gi|143407	pere-aminobenzoic acid synthase, component 1 (pab) [Bacillus subtilis]	58	53	222

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
437	1	325	1354	gi11303866	YqgS (Bacillus subtilis)	58	35	1230
445	1	105	1442	gi1581583	protein A (Staphylococcus aureus)	58	52	1338
453	3	789	965	gi11009455	unknown (Schistosaccharomyces pombe)	58	34	177
453	5	2748	2047	gi1537214	yjg gene product (Escherichia coli)	58	40	702
479	2	731	1444	gi11256621	26.7% of identity in 165 aa to a Thermophilic bacterium hypothetical protein 6; putative (Bacillus subtilis)	58	36	714
490	1	909	547	gi1580920	rodd (gtaA) polypeptide (AA 1-673) (Bacillus subtilis) pir[S06048]S06048 probable rodd protein - Bacillus subtilis sp[P13484]TAGE-BACSU PROBABLE POLY(GLYCEROL-PHOSPHATE) LPHA-GLUCOSYLTRANSFERASE (EC 2.4.1.52) (TECHOIC ACID BIOSYNTHESIS ROBIN E)	58	36	363
517	1	1	1164	gi1472641018	[HYPOTHETICAL HELICASE MG018]	58	30	1164
517	6	4182	4344	gi1453422	orf268 gene product (Mycoplasma hominis)	58	29	363
546	3	2802	4019	gi1886052	restriction modification system S subunit (Spiroplasma citri) gi1886052 restriction modification system S subunit (Spiroplasma citri)	58	37	1218
562	1	3	179	gi143831	nifS protein (AA 1-400) (Klebsiella pneumoniae)	58	34	177
600	2	1347	1156	gi11181839	unknown (Pseudomonas aeruginosa)	58	48	192
604	2	1231	1001	gi11001353	hypothetical protein (Synecocystis sp.)	58	41	231
619	1	1	504	gi1903748	integral membrane protein (Homo sapiens)	58	43	504
625	1	2	364	gi11208474	hypothetical protein (Synecocystis sp.)	58	43	363
635	1	1492	755	gi11510995	transaldolase (Methanococcus jannaschii)	58	41	738
645	1	1	846	gi1677882	ileal sodium-dependent bile acid transporter (Rattus norvegicus) gi1677882 ileal sodium-dependent bile acid transporter (Rattus norvegicus)	58	33	846
645	3	906	1556	gi11239999	hypothetical protein (Bacillus subtilis)	58	41	651
665	1	771	532	gi11204262	hypothetical protein (G8:L10328.61) (Haemophilus influenzae)	58	39	240
674	1	635	327	gi1498817	ORF8; homologous to small subunit of phage terminase (Bacillus subtilis)	58	39	309
675	2	1312	806	gi142181	osmC gene product (Escherichia coli)	58	28	507
745	1	618	310	gi11205432	coenzyme Q10 synthesis protein III (pqqIII) (Haemophilus influenzae)	58	32	309
799	2	242	1174	gi11204669	collagenase (Haemophilus influenzae)	58	36	933
800	2	1096	614	gi1171963	tRNA isopentenyl transferase (Saccharomyces cerevisiae) sp[P07884]H005-YEAST TRNA ISOPENTENYLTRANSFERASE (EC 2.5.1.8) ISOPENTENYL-DIPHOSPHATE: TRNA ISOPENTENYLTRANSFERASE (IPP TRANSFERASE) (IPPT)	58	37	483

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
854	1	1108	605	gi1466778	lysine specific permease [Escherichia coli]	58	44	504
885	1	481	242	gi1861199	protoporphyrin IX Mg-chelatase subunit precursor [Hordeum vulgare]	58	33	240
891	1	3	527	gi1293660	abaA2 [Streptomyces coelicolor]	58	31	525
942	1	931	467	gi1405567	traH [Plasmid pSK41]	58	30	465
1002	1	952	521	gi1577649	prolUOK [Staphylococcus aureus]	58	34	432
1438	1	1	261	gi1581558	isoLeuyl-tRNA synthetase [Staphylococcus aureus] sp|P41366|SYIP_STA00 ISOLEUCYL-TRNA SYNTHETASE, MUPIROICIN RESISTANT EC 6.1.1.5 (ISOLEUCINE-- THNA LIQASE) (ILERS) (MUPIROICIN RESISTANCE ROTENIN)	58	30	261
1442	1	2	463	gi1971394	similar to Acc.No. D26185 [Escherichia coli]	58	34	462
1873	1	480	241	gi1319951	small subunit of NADH-dependent glutamate synthase [Plectonema boryanum]	58	38	240
1876	1	3	158	gi1529216	No definition line found [Caenorhabditis elegans] sp|P46503|YLY7_CAEEL HYPOTHETICAL 7.3 KO PROTEIN F23F12.7 IN WORMSOME III.	58	33	156
1989	1	108	401	gi1405458	YnaK [Bacillus subtilis]	58	29	294
2109	1	3	401	gi11001801	hypothetical protein [Synecocystis sp.]	58	31	399
2473	1	288	145	gi1510140	lipoendopeptidase F [Lactococcus lactis]	58	38	144
2523	1	452	228	gi1644873	catabolic dehydroquinase dehydratase [Acinetobacter calcoaceticus]	58	37	225
3041	1	2	211	gi1205367	oligopeptide transport ATP-binding protein [Haemophilus influenzae]	58	39	210
3094	1	3	263	gi11185288	isochoaramate synthase [Bacillus subtilis]	58	38	261
3706	1	3	383	gi1456618	nevalonate kinase [Arabidopsis thaliana]	58	48	381
3854	1	1	402	gi1808869	human gcp372 [Homo sapiens]	58	32	402
4082	1	51	224	gi1508551	ribulose-1,5 biphosphate carboxylase large subunit -methyltransferase [Pisum sativum]	58	37	174
4278	1	3	206	gi1180189	cerebellar-degeneration-related antigen (CDR34) [Homo sapiens] gi1182737 cerebellar degeneration-associated protein [Homo sapiens] p1r[A29770]A29770 cerebellar degeneration-related protein - human	58	37	204
19	7	7818	7363	gi11001516	hypothetical protein [Synecocystis sp.]	57	31	456
23	11	9663	8872	gi1606066	ORF f256 [Escherichia coli]	57	29	792
31	1	4801	2402	gi133146	ORP3 [Streptomyces coelicolor]	57	32	2400
38	14	11611	10796	gi144859	ORF B [Clostridium perfringens]	57	31	816
46	14	12063	13046	gi11001319	hypothetical protein [Synecocystis sp.]	57	25	984

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
51	3	1411	1187	gi|131856|B138 [hypothetical 80K protein - Bacillus sphaericus]	57	38	225
54	1	1	453	gi|1684950 [staphylococcal accessory regulator A (Staphylococcus aureus)]	57	31	453
75	1	3	239	gi|1000470 [C2787.7 (Caenorhabditis elegans)]	57	42	237
92	5	3855	3061	gi|143607 [sporulation protein (Bacillus subtilis)]	57	35	795
96	3	4006	4773	gi|144297 [acetyl asferase (XyNC) (Caldocellum saccharolyticum) pIR|B37202|B37202 acetyltransferase (EC 3.1.1.6) (XyNC) - Caldocellum saccharolyticum]	57	34	768
107	3	1480	2076	gi|460955 [TagS (Vibrio cholerae)]	57	42	597
109	8	5340	5933	gi|1438846 [Unknown (Bacillus subtilis)]	57	41	594
112	9	6679	7701	gi|1466250 [Unknown (Bacillus subtilis)]	57	33	1023
114	4	6384	4108	gi|871456 [putative alpha subunit of formate dehydrogenase (Methanobacterium thermoautotrophicum)]	57	37	2277
126	2	430	1053	gi|288301 [ORF2 gene product (Bacillus megaterium)]	57	37	624
131	5	6537	6277	gi|1511160 [M. Jannaschii predicted coding region MJ1163 (Methanococcus jannaschii)]	57	38	261
133	3	2668	2201	gi|1303912 [YghW (Bacillus subtilis)]	57	40	468
133	4	3383	2784	gi|1221884 [urea? amidolyase (Haemophilus influenzae)]	57	37	600
147	4	2164	1694	gi|467469 [Unknown (Bacillus subtilis)]	57	33	471
160	2	1293	1060	gi|558604 [chitin synthase 2 (Neurospora crassa)]	57	28	234
163	8	5687	4764	gi|145580 [rard gene product (Escherichia coli)]	57	38	924
168	6	4336	5325	gi|39782 [33kDa lipoprotein (Bacillus subtilis)]	57	32	990
170	5	3297	3455	gi|603404 [Yer164p (Saccharomyces cerevisiae)]	57	37	159
221	6	8026	6809	gi|1136221 [carboxypeptidase (Sulfolobus solfataricus)]	57	32	1218
228	3	1348	1791	gi|288969 [fibronectin binding protein (Streptococcus dysgalactiae) pIR|S33850|S33850 fibronectin-binding protein - Streptococcus dysgalactiae]	57	32	444
263	4	4411	3686	gi|1185002 [dihydrodipicolinate reductase (Pseudomonas syringae pv. tabaci)]	57	42	726
276	1	494	255	gi|396380 [No definition line found (Escherichia coli)]	57	40	240
283	2	335	1324	gi|773349 [B1A protein (Bacillus subtilis)]	57	32	990
297	1	469	236	gi|1334820 [reading frame V (Cauliflower mosaic virus)]	57	46	234
342	3	1993	2805	gi|1204431 [Hypothetical protein (SP:P33644) (Haemophilus influenzae)]	57	35	813

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
375	6	3340	3741	gi|385177	cell division protein [Bacillus subtilis]	57	26	402
433	6	3286	4011	gi|1524117	alpha-acetolactate decarboxylase [Lactococcus lactis]	57	40	726
470	3	903	1145	gi|104819	protein serine/threonine kinase [Toxoplasma gondii]	57	30	243
487	5	1391	1723	gi|507323	ORF1 [Bacillus stearothermophilus]	57	28	333
498	1	274	852	gi|1334549	MDM-ubiquitin oxidoreductase subunit 4L [Podospira anserina]	57	34	579
503	1	343	173	gi|1502283	organic cation transporter OCT2 [Rattus norvegicus]	57	30	171
505	2	1619	1284	gi|466884	gi|496_C2_194 [Mycobacterium leprae]	57	40	336
519	2	1182	2549	gi|1303707	YrkH [Bacillus subtilis]	57	34	1368
522	2	3234	1945	gi|1064809	homologous to sp:HTRA_ECOLI [Bacillus subtilis]	57	36	1290
538	2	909	1415	gi|153179	phosphorothioic n-acetyltransferase [Streptomyces coelicolor] pirJH0246|JH0246 phosphothioic n-acetyltransferase (EC 2.3.1.-) Streptomyces coelicolor	57	40	507
547	1	968	486	gi|467340	unknown [Bacillus subtilis]	57	30	483
599	1	1062	532	gi|120692|TYRA_	PREPHENATE DEHYDROGENASE (EC 1.3.1.12) (PDH)	57	41	531
620	2	757	572	gi|1107894	unknown [Schizosaccharomyces pombe]	57	38	186
622	2	1600	1130	gi|1173028	thiorodoxin 11 [Saccharomyces cerevisiae]	57	39	471
625	2	382	1114	gi|1262366	hypothetical protein [Mycobacterium leprae]	57	34	753
680	1	1	204	gi|143544	RNA polymerase sigma-30 factor [Bacillus subtilis] pirJA28625|A28625 transcription initiation factor sigma H - acillus subtilis	57	30	204
690	1	3	629	gi|466520	poCR [Salmonella typhimurium]	57	29	627
696	1	2	433	gi|413972	ipa-48r gene product [Bacillus subtilis]	57	33	432
704	1	36	638	gi|1699931	M. jannaschii predicted coding region MJ1083 [Methanococcus jannaschii]	57	36	603
732	1	2316	1621	gi|1418999	orf4 [Lactobacillus sake]	57	37	696
746	1	451	227	gi|392973	Rah3 [Aplysia californica]	57	42	225
757	1	20	466	gi|43979	L. curvatus small cryptic plasmid gene for rep protein [Lactobacillus rvaus]	57	45	447
862	1	2	295	gi|1303827	YqfI [Bacillus subtilis]	57	21	294
1049	1	907	455	gi|1510108	ORF-1 [Agrobacterium tumefaciens]	57	35	453
1117	1	1387	695	gi|896286	MW2 terminus uncertain [Leishmania tarentolae]	57	28	693

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
1136	1	2	322	gi11303853	YqoF (Bacillus subtilis)	57	38	321
1148	2	1033	611	gi1310083	voltage-activated calcium channel alpha-1 subunit (Rattus orvegicus)	57	46	423
1172	1	1472	738	gi1511146	M. jannaschii predicted coding region M1143 (Methanococcus jannaschii)	57	28	735
1500	2	746	558	gi1142780	putative membrane protein; putative (Bacillus subtilis)	57	35	189
1676	1	659	399	gi1313777	lurec1 permease (Escherichia coli)	57	31	261
2481	1	2	400	gi11237015	ORF4 (Bacillus subtilis)	57	23	399
3099	1	3	230	gi11204540	isochloramate synthase (Haemophilus influenzae)	57	19	228
3122	1	360	181	gi1882472	ORF 0464 (Escherichia coli)	57	40	180
3560	1	2	361	gi153490	tetracycline C resistance and export protein (Streptomyces laueacens)	57	37	360
3850	1	856	434	gi1155588	glucose-fructose oxidoreductase (Zymomonas mobilis) p1r/A42289/A42289	57	40	423
3931	1	704	334	gi1413933	lipo-29d gene product (Bacillus subtilis)	57	36	351
3993	1	1	384	gi1151259	HM-CoA reductase (EC 1.1.1.88) (Pseudomonas mavalonit) p1r/A44756/A44756	57	39	384
4065	1	793	398	gi1300371RDEC	hydroxymethylglutaryl-CoA reductase (EC 1.1.1.88) Pseudomonas sp.	57	31	396
4100	1	596	300	gi11086633	nitrate reductase (EC 1.7.99.4) alpha chain - Escherichia coli	57	47	297
4163	1	571	287	gi121512	T06C10.5 gene product (Caenorhabditis elegans)	57	50	285
4267	2	631	335	gi11000365	putatin (Solanum tuberosum)	57	38	297
4358	1	3	302	gi1298032	SpoIIAG (Bacillus subtilis)	57	32	300
4389	2	108	290	gi1405894	EF (Streptococcus suis)	57	37	183
4399	1	2	232	gi11483603	1-phosphofructokinase (Escherichia coli)	57	35	231
4481	1	572	288	gi1405879	Pristinamycin I synthase 1 (Streptomyces pristinaespiralis)	57	44	285
4486	1	512	258	gi1515938	yeoH (Escherichia coli)	57	42	255
4510	1	481	242	gi11205301	glutamate synthase (ferredoxin) (Synecocystis sp.) p1r/S46957/S46957	57	18	240
4617	1	468	256	gi11511222	glutamate synthase (ferredoxin) (EC 1.7.1.1) - ynechocystis sp.	57	35	213
4	11	12201	11524	gi1149204	leukotoxin secretion ATP-binding protein (Haemophilus influenzae)	56	31	678
					restriction modification enzyme, subunit M1 (Methanococcus jannaschii)			
					histidine utilization repressor G (Klebsiella aerogenes) p1r/A36730/A36730			
					hucG protein - Klebsiella pneumoniae (fragment) sp1P19452/HUCG_KLENE			
					FORMINOLUTAMINASE (EC 3.5.3.8) FORMINOLUTAMINATE HYDROLASE (HISTIDINE UTILIZATION PROTEIN G) FRAGMENT)			

TABLE 2

5. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
22	8	4248	5177	gi|1322222	BACH1 (Homo sapiens)	56	33	930
36	28	21179	22264	gi|1480705	lipote-protein ligase (Mycoplasma capricolum)	56	34	1086
44	3	1861	2421	gi|490320	Y gene product (unidentified)	56	31	561
44	15	10103	10606	gi|1205099	hypothetical protein (CB:LI9201_1) (Haemophilus influenzae)	56	39	504
50	6	4820	5161	gi|209931	fiber protein (Human adenovirus type 5)	56	48	342
53	4	2076	2972	gi|623476	transcriptional activator (Providencia stuartii) sp|P43463|AARP_PROST	56	30	897
67	6	5656	6594	gi|466613	nika (Escherichia coli)	56	32	939
89	3	2364	1810	gi|482922	protein with homology to pail repressor of B. subtilis (Lactobacillus elbrueckii)	56	39	555
96	1	203	913	gi|145594	CAMP receptor protein (crp) (Escherichia coli)	56	35	711
109	121	18250	17846	gi|1204367	hypothetical protein (CB:U14003_378) (Haemophilus influenzae)	56	27	405
112	8	5611	6678	gi|155588	glucose-fructose oxidoreductase (Zymomonas mobilis) pif|A42289|A42289	56	40	1068
131	3	6404	5100	gi|619724	MgtE (Bacillus firmus)	56	30	1305
136	2	65	232	gi|413948	lpa-24d gene product (Bacillus subtilis)	56	31	168
138	4	823	1521	gi|580868	lpa-22r gene product (Bacillus subtilis)	56	31	699
146	2	740	447	gi|1046009	M. genitalium predicted coding region MG309 (Mycoplasma genitalium)	56	37	294
149	2	1639	1067	gi|945380	corninase small subunit (Bacteriophage LU-11)	56	35	573
163	1	2	223	gi|143947	glutamine synthetase (Bacteroides fragilis)	56	30	222
166	5	6745	6449	gi|405792	ORF154 (Pseudomonas putida)	56	26	297
187	1	31	393	gi|311237	H(+)-transporting ATP synthase (Zea mays)	56	30	363
190	1	2	373	gi|1109686	ProX (Bacillus subtilis)	56	35	372
191	8	11538	9943	gi|581070	acyl coenzyme A synthetase (Escherichia coli)	56	35	1596
195	1	1291	647	gi|1510242	collagenase (Methanococcus jannaschii)	56	34	645
230	3	2323	2072	gi|140363	heat shock protein (Clostridium acetobutylicum)	56	39	252
238	5	3383	3775	gi|1477533	lsrA (Staphylococcus aureus)	56	31	383
270	2	813	1712	gi|1765073	autolysin (Staphylococcus aureus)	56	41	900

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
290	1	3221	1632	gi|547513	orf3 [Haemophilus influenzae]	56	34	1590
297	5	1140	1373	gi|1511556	M. jannaschii predicted coding region MJ1561 [Methanococcus jannaschii]	56	40	234
321	2	2967	1799	gi|1001801	hypothetical protein [Synecocystis sp.]	56	31	1149
359	2	1279	641	gi|46336	ncol1 gene product [Rhizobium meliloti]	56	26	639
371	2	360	1823	gi|145304	U-ribulokinase [Scherichia coli]	56	39	1464
391	4	1762	2409	gi|1001634	hypothetical protein [Synecocystis sp.]	56	34	648
402	1	380	192	gi|1438904	[S-MT4L receptor [Homo sapiens]	56	48	189
416	4	2480	2109	gi|1408486	HS74A gene product [Bacillus subtilis]	56	31	372
424	3	1756	2334	gi|142471	acetolactate decarboxylase [Bacillus subtilis]	56	32	579
457	1	1907	1017	gi|1205194	[formamidopyrimidine-DNA glycosylase [Haemophilus influenzae]	56	36	891
458	2	2423	1812	gi|175466	terminase [Bacteriophage Sphi]	56	37	612
504	2	2152	1283	gi|1142681	lpp38 [Pasteurella hemolytica]	56	38	870
511	1	1	1284	gi|217049	brnQ protein [Salmonella typhimurium]	56	37	1284
603	3	1099	1701	gi|467109	rim: 30S ribosomal protein S18 alanine acetyltransferase: 229_C1_170 [Mycobacterium leprae]	56	43	603
660	5	3547	3774	gi|1229106	[ZK930.1 [Caenorhabditis elegans]	56	30	228
707	1	35	400	gi|153929	NADPH-auxite reductase flavoprotein component [Salmonella typhimurium]	56	38	366
709	2	1345	1095	gi|1510801	hydrogenase accessory protein [Methanococcus jannaschii]	56	38	291
718	1	1	495	gi|411948	[lpa-24d gene product [Bacillus subtilis]	56	35	495
744	1	87	677	gi|928836	repressor protein [Lactococcus lactis phage BK5-7]	56	35	591
790	1	776	399	gi|1511513	ABC transporter, probable ATP-binding subunit [Methanococcus jannaschii]	56	33	378
795	1	3	407	gi|1205382	cell division protein [Haemophilus influenzae]	56	34	405
813	1	19	930	gi|1222161	permease [Haemophilus influenzae]	56	28	912
855	1	3	515	gi|1256621	36.7% of identity in 165 aa to a Thermophilic bacterium hypothetical protein 6; putative [Bacillus subtilis]	56	33	513
968	1	2	466	gi|547513	orf3 [Haemophilus influenzae]	56	37	465
973	2	1049	732	gi|886022	MexA [Pseudomonas aeruginosa]	56	31	318
1203	1	5	223	gi|184251	[HKG-1 [Homo sapiens]	56	34	219

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
1976	1	452	237	gi|19806	lysine-rich aspartic acid-rich protein [Plasmodium chabaudi] r|S22183|S22183 lysine/aspartic acid-rich protein - Plasmodium baodi	56	33	216
2161	1	2	400	gi|1237015	ORF4 [Bacillus subtilis]	56	27	399
2958	1	362	183	gi|466685	No definition line found [Escherichia coli]	56	26	180
2979	1	421	212	gi|1204354	spore germination and vegetative growth protein [Haemophilus influenzae]	56	40	210
2994	2	526	326	gi|836646	phosphoribosylformylino-praic ketolomerase [Rhodobacter phaeoideus]	56	29	201
3026	1	173	328	gi|143306	penicillin V amidase [Bacillus sphaericus]	56	30	150
3189	1	289	146	gi|1166604	similar to aldehyde dehydrogenase [Caenorhabditis elegans]	56	37	144
3770	1	63	401	gi|1129145	acetyl-CoA C-acyltransferase [Mangifera indica]	56	43	339
4054	2	720	361	gi|1205355	Na ⁺ /H ⁺ antiporter [Haemophilus influenzae]	56	31	360
4145	1	1	324	gi|726095	long-chain acyl-CoA dehydrogenase [Mus musculus]	56	36	324
4200	1	505	254	gi|155588	glucose-fructose oxidoreductase [Symonema mobilis] pir|A42289|A42289 glucose-fructose oxidoreductase (EC 1.1.1.-) recursor - Symonema mobilis	56	40	252
4273	1	675	355	gi|308861	GTG start codon [Lactococcus lactis]	56	33	321
1	3	4095	3436	gi|5341	Putative orf YCM8c, len:192 [Saccharomyces cerevisiae] r|S53591|S53591 hypothetical protein - yeast [Saccharomyces cerevisiae]	55	25	660
11	12	9377	8505	gi|216723	haloacetate dehalogenase H-1 [Moraxella sp.]	55	32	873
12	4	5133	4534	gi|467337	unknown [Bacillus subtilis]	55	26	600
19	5	5404	5844	gi|1001719	hypothetical protein [Synecocystis sp.]	55	25	441
23	13	14087	11239	gi|474190	lucA gene product [Escherichia coli]	55	30	1749
32	7	5368	6888	gi|1340096	unknown [Mycobacterium tuberculosis]	55	37	1521
34	3	2569	1808	gi|1303968	YqjQ [Bacillus subtilis]	55	39	762
34	5	3960	3412	gi|1303962	YqjK [Bacillus subtilis]	55	33	549
36	1	1291	647	gi|604045	ORF_0118 [Escherichia coli]	55	27	645
36	6	6220	5243	gi|1001341	hypothetical protein [Synecocystis sp.]	55	31	978
47	3	3054	3821	gi|1001819	hypothetical protein [Synecocystis sp.]	55	21	768
49	1	2065	1127	gi|403373	glycerophosphoryl diester phosphodiesterase [Bacillus subtilis] pir|S37251|S37251 glycerophosphoryl diester phosphodiesterase - acillus subtilis	55	36	939

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
67	11	8966	9565	gi1153053	norA199 protein [Staphylococcus aureus]	55	23	600
75	3	881	1273	gi121698	U-biotinidol: NAD ⁺ oxidoreductase [EC 1.1.1.231] (aa 1-434) [scherichia coli]	55	33	393
82	9	15387	14194	gi1136221	carboxypeptidase [Sulfolobus solfataricus]	55	35	1194
87	4	3517	4917	gi11064812	function unknown [Bacillus subtilis]	55	26	1401
88	2	1172	1636	gi1882463	protein-Nip1-phosphohistidine-sugar phosphotransferase [Escherichia coli]	55	35	465
92	1	127	516	gi11377832	unknown [Bacillus subtilis]	55	36	390
100	2	836	2035	gi11370274	zeaxanthin epoxidase [Nicotiana glauca]	55	36	1200
100	5	5137	4658	gi1376660	unknown open reading frame [Buchnera aphidicola]	55	29	480
108	3	4266	2986	gi11499866	M. jannaschii predicted coding region MJ1024 [Methanococcus jannaschii]	55	31	1281
114	3	2616	1834	gi11511367	formate dehydrogenase, alpha subunit [Methanococcus jannaschii]	55	29	783
144	3	1805	1476	gi1100787	unknown [Saccharomyces cerevisiae]	55	35	330
165	5	6212	5508	gi11045884	M. genitalium predicted coding region MG199 [Mycoplasma genitalium]	55	27	705
189	5	2205	2576	gi1142569	ATP synthase alpha subunit [Bacillus firmus]	55	35	372
191	6	9136	6857	gi1559411	180272.3 [Caenorhabditis elegans]	55	39	2280
194	2	364	636	gi11145768	K7 kinesin-like protein [Dictyostelium discoideum]	55	34	273
209	4	1335	1676	gi1473357	chi4 gene product [Schizosaccharomyces pombe]	55	35	342
211	2	1693	1145	gi1410130	ORFX6 [Bacillus subtilis]	55	37	549
213	2	644	1372	gi1633692	TrxA [Yersinia enterocolitica]	55	28	729
214	7	4144	5481	gi11001793	hypothetical protein [Synecocystis sp.]	55	30	1338
221	7	11473	9197	gi1466520	pocr [Salmonella typhimurium]	55	32	2277
233	8	5908	4817	gi11237063	unknown [Mycobacterium tuberculosis]	55	38	1092
236	4	1375	2340	gi11146199	putative [Bacillus subtilis]	55	32	966
243	2	380	1885	gi1459907	mercuric reductase [Plasmid p1258]	55	29	1506
258	1	786	394	gi1455006	orf6 [Rhodococcus fascians]	55	36	393
281	1	126	938	gi11408493	homologous to SwissProt:VIDA_ECOLI hypothetical protein [Bacillus subtilis]	55	35	813
316	3	1323	2102	gi11486447	luxA homologue [Rhizobium sp.]	55	30	780
326	5	2968	2744	gi11296824	proline iminopeptidase [Lactobacillus helveticus]	55	36	225

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
351	2	2322	1429	gi11204820	hydrogen peroxide-inducible activator (Haemophilus influenzae)	55	28	894
353	4	2197	2412	gi11272475	chitin synthase (Emerella nidulans)	55	50	216
380	1	14	379	gi1142554	ATP synthase i subunit (Bacillus megaterium)	55	37	166
381	1	462	232	gi1289272	ferrichrome-binding protein (Bacillus subtilis)	55	36	231
386	1	3	938	gi11510251	DNA helicase, putative (Methanococcus jannaschii)	55	30	936
410	2	1208	1891	gi11205164	multidrug resistance protein (Haemophilus influenzae)	55	27	684
483	2	411	833	gi1143934	lipo-10r gene product (Bacillus subtilis)	55	26	423
529	3	1777	1433	gi11606150	ORF_1309 (Escherichia coli)	55	31	345
555	1	1088	585	gi1143407	para-aminobenzoic acid synthase, component I (pab) (Bacillus subtilis)	55	28	504
565	1	402	202	gi11223961	CDP-tyvelose epimerase (Yersinia pseudotuberculosis)	55	41	201
582	1	751	452	gi11256643	20.2% identity with NADH dehydrogenase of the Leishmania major mitochondrion, putative (Bacillus subtilis)	55	36	300
645	5	2260	2057	gi1210824	fusion protein F (bovine respiratory syncytial virus) p1c[01481]VOR28A fusion glycoprotein precursor - bovine respiratory syncytial virus (strain A51908)	55	25	204
672	2	957	2216	gi11511333	M. jannaschii predicted coding region M1322 (Methanococcus jannaschii)	55	36	1260
730	1	955	479	gi11537007	ORF_1379 (Escherichia coli)	55	30	477
737	1	1859	945	gi11536963	CG site No. 18166 (Escherichia coli)	55	30	915
742	2	228	572	gi1304160	product unknown (Bacillus subtilis)	55	38	345
817	2	1211	903	gi11136289	histidine kinase A (Dictyostelium discoideum)	55	29	309
819	1	582	355	gi11558073	polymorphic antigen (Plasmodium falciparum)	55	22	228
832	2	1152	724	gi140367	ORF1 (Clostridium acetobutylicum)	55	32	429
840	1	769	386	gi11205875	pseudouridylylase synthase I (Haemophilus influenzae)	55	39	384
1021	1	23	529	gi1148563	beta-lactamase (Yersinia enterocolitica)	55	38	507
1026	1	60	335	gi1147804	Opp C (AA1-301) (Salmonella typhimurium)	55	26	276
1525	1	1	282	gi11477533	lsarA (Staphylococcus aureus)	55	29	282
1814	2	224	985	gi11046078	M. genitalium predicted coding region MG369 (Mycoplasma genitalium)	55	38	762
3254	1	427	254	gi1413968	lipo-44d gene product (Bacillus subtilis)	55	30	174

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
3695	1	686	345	gi|216773	haloacetate dehalogenase H-1 [Moraxella sp.]	55	32	342
3721	1	1	312	gi|42029	ORF1 gene product [Escherichia coli]	55	31	312
3759	1	3	272	gi|42029	ORF1 gene product [Escherichia coli]	55	38	270
3889	1	22	423	gi|1129145	acetyl-CoA C-acetyltransferase [Mangifera indica]	55	45	402
3916	1	2	385	gi|529754	IspeC [Streptococcus pyogenes]	55	38	384
3945	1	4	198	gi|476252	phase 1 flagellin [Salmonella enterica]	55	36	195
4074	1	488	246	gi|42029	ORF1 gene product [Escherichia coli]	55	38	243
4184	1	2	243	gi|1524267	unknown [Mycobacterium tuberculosis]	55	28	242
4284	1	14	208	gi|1100774	ferredoxin-dependent glutamate synthase [Synechocystis sp.]	55	36	195
4457	2	644	378	gi|180189	cerebellar-degeneration-related antigen (CDR34) [Homo sapiens] gi|182737 cerebellar degeneration-associated protein [Homo sapiens] pir|A29770|A29770 cerebellar degeneration-related protein - human	55	38	267
4514	1	2	244	gi|216773	haloacetate dehalogenase H-1 [Moraxella sp.]	55	32	243
4599	1	432	217	gi|1129145	acetyl-CoA C-acetyltransferase [Mangifera indica]	55	42	216
4606	1	416	210	gi|386120	myosin alpha heavy chain (S2 subfragment) (rabbits, masseter, epitope partial, 234 aa)	55	27	207
5	8	5348	4932	gi|536059	ORF YBL047c [Saccharomyces cerevisiae]	54	27	417
12	7	7166	6165	gi|1205504	homoserine acetyltransferase [Haemophilus influenzae]	54	30	1002
23	16	17086	15326	gi|474192	lucC gene product [Escherichia coli]	54	31	1761
35	1	2	979	gi|48054	small subunit of soluble hydrogenase (AA 1-384) [Synechococcus sp.] lr|506919|HOYCS5 soluble hydrogenase (EC 1.12.-.-) small chain - neohococcus sp. (PCC 6716)	54	36	978
37	11	9417	8667	gi|537207	ORF 4377 [Escherichia coli]	54	38	771
37	12	8165	8332	gi|1160967	palmitoyl-protein thioesterase [Homo sapiens]	54	37	168
46	15	13025	13804	gi|438473	protein is hydrophobic, with homology to E. coli PrmW; putative Bacillus subtilis	54	28	760
56	2	203	736	gi|1256139	YBBJ [Bacillus subtilis]	54	34	534
57	13	11117	10179	gi|1151248	inosine-uridine preferring nucleoside hydrolase [Crithidia fasciculata]	54	32	939
66	2	516	1133	gi|1335781	Cap [Drosophila melanogaster]	54	29	618
70	10	8116	8646	gi|1399823	PhoE [Rhizobium meliloti]	54	31	531

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
70	15	12556	11801	[sp|P02983|TCR_S	TETRACYCLINE RESISTANCE PROTEIN.	54	29	756
87	5	4915	5706	[gi|1064811	[function unknown [Bacillus subtilis]	54	33	792
92	4	3005	2289	[gi|1205366	[oligopeptide transport ATP-binding protein [Haemophilus influenzae]	54	33	717
103	2	2596	1556	[gi|710495	[protein kinase [Bacillus brevis]	54	33	1041
105	2	3585	2095	[gi|143727	[putative [Bacillus subtilis]	54	30	1491
112	4	2137	2732	[gi|153724	[HcIC [Streptococcus pneumoniae]	54	41	396
127	2	1720	2493	[gi|144297	[acetyl esterase (XynC) [Caldoecium saccharolyticum] pir|B37202|B37202	54	34	774
138	5	1600	3306	[gi|42473	[pyruvate oxidase [Escherichia coli]	54	36	1707
152	2	525	1172	[gi|1372834	[unknown [Bacillus subtilis]	54	23	648
161	9	4831	5469	[gi|1903105	[ORF73 [Bacillus subtilis]	54	28	639
161	13	6694	7251	[gi|1511039	[phosphate transport system regulatory protein [Methanococcus jannaschii]	54	32	558
164	6	3263	4543	[gi|1204976	[involyl-tRNA synthetase [Haemophilus influenzae]	54	34	1281
164	20	21602	22243	[gi|143582	[spolIIEA protein [Bacillus subtilis]	54	32	642
171	6	5683	4250	[gi|436965	[IsaA] gene products [Bacillus stearothermophilus] pir|S43914|S43914	54	37	1434
206	18	19208	19720	[gi|1240016	[hypothetical protein 1 - Bacillus stearothermophilus	54	38	513
218	2	1090	1905	[gi|487378	[R09E10.1 [Caenorhabditis elegans]	54	26	816
220	1	1322	663	[gi|1353761	[unknown [Bacillus subtilis]	54	22	660
220	13	12655	13059	[pir|S00485|S004	[myosin II heavy chain [Naegleria fowleri]	54	35	405
221	3	2030	3709	[gi|1303813	[gene 11-1 protein precursor - Plasmodium falciparum (fragments)	54	34	1680
272	7	5055	4219	[gi|62964	[yqew [Bacillus subtilis]	54	33	837
316	7	4141	4701	[gi|682769	[arylamine N-acetyltransferase (AA 1-290) [Gallus gallus] ir|S06652|XVCHV3	54	31	561
316	10	6994	8742	[gi|433951	[arylamine N-acetyltransferase (EC 2.3.1.5) (clone NAT-3) - chicken	54	28	1749
338	3	3377	2214	[gi|490328	[accE gene product [Escherichia coli]	54	28	1163
341	4	3201	3614	[gi|171959	[lipa-27d gene product [Bacillus subtilis]	54	25	414
					[LORF F (unidentified)			
					[myosin-like protein [Saccharomyces cerevisiae]			

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
346	1	1820	912	gi|396400	similar to eukaryotic Na ⁺ /H ⁺ exchangers [Escherichia coli] sp|P32703|YJCE_ECOLI HYPOTHETICAL 60.5 KD PROTEIN IN SOKR-ACS HYPERGENIC REGION (0549)	54	34	909
348	2	623	1351	gi|537109	ORF_343a [Escherichia coli]	54	34	729
378	2	1007	1942	sp|P02983|TCR_S	TETRACYCLINE RESISTANCE PROTEIN	54	31	936
408	6	4351	5301	gi|474190	lucA gene product [Escherichia coli]	54	29	951
444	9	7934	8854	gi|216267	ORF2 [Bacillus megaterium]	54	32	921
463	2	2717	2229	gi|304160	product unknown [Bacillus subtilis]	54	50	489
502	2	1696	1133	gi|1205015	hypothetical protein (sp|P10120) [Haemophilus influenzae]	54	38	564
505	6	6262	5357	gi|1500558	2-hydroxyhepta-2,4-diene-1,7-dioate isomerase [Mechanococcus jannaschii]	54	41	906
550	1	2736	1522	gi|40100	rodC (tag3) polypeptide (AA 1-746) [Bacillus subtilis] tr|S06049|S06049 rodC protein - Bacillus subtilis p|P3485|TAGP_BACSU TECHOIC ACID BIOSYNTHESIS PROTEIN F.	54	35	1215
551	5	4305	4279	gi|950197	unknown [Corynebacterium glutamicum]	54	34	975
558	2	1356	958	gi|483090	[No definition line found [Caenorhabditis elegans]	54	32	399
580	1	91	936	gi|331906	[used envelope glycoprotein precursor [Friend spleen focus-forming virus]	54	45	846
603	3	554	757	gi|1323423	ORF YGR214w [Saccharomyces cerevisiae]	54	36	204
617	1	25	249	gi|219959	ornithine transcarbamylase [Homo sapiens]	54	40	225
622	3	1097	1480	gi|1301873	YggZ [Bacillus subtilis]	54	25	384
623	1	3	404	gi|1063250	low homology to P20 protein of Bacillus licheniformis and bleomycin acetyltransferase of Streptomyces verticillus [Bacillus subtilis]	54	45	402
689	1	1547	1011	gi|552446	[NADH dehydrogenase subunit 4 [Apis mellifera ligulata] p|tr|S52968|S52968 NADH dehydrogenase chain 4 - honeybee Itochondrion (SC4)	54	30	537
725	2	686	1441	gi|987096	sensory protein kinase [Streptomyces hygroscopicus]	54	26	756
956	1	1	249	p|tr|S10782|S107	Integrin homolog - yeast [Saccharomyces cerevisiae]	54	24	249
978	2	1137	859	gi|1301994	ORF YNL091w [Saccharomyces cerevisiae]	54	33	279
1314	1	3	281	gi|1001108	hypothetical protein [Synchocystis sp.]	54	33	279
2450	1	1	228	gi|1045057	ch-TOG [Homo sapiens]	54	32	228
2834	1	1	387	gi|580870	ipa-37d qoxA gene product [Bacillus subtilis]	54	36	387
2970	1	499	251	sp|P3734P|VECE	HYPOTHETICAL PROTEIN IN ASPS 5-REGION (FRAGMENT)	54	42	249

TABLE 2

S aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	mayq gene name	% sim	% ident	length (nt)
3002	1	1	309	gi|44027	Tna protein [Lactococcus lactis]	54	33	309
3561	1	9	464	gi|151259	HMG-CoA reductase (EC 1.1.1.88) [Pseudomonas nevalonii] pir[A44756]A44756 hydroxymethylglutaryl-CoA reductase (EC 1.1.1.88) Pseudomonas sp.	54	35	456
3572	1	72	401	gi|450688	hmdM gene of Escherichia coli product [Escherichia coli] pir[S38437]S38437 hmdM protein - Escherichia coli pir[S09629]S09629 hypothetical protein A - Escherichia coli (SUB 40-520)	54	36	330
3829	1	798	400	gi|1322245	mevalonate pyrophosphate decarboxylase [Rattus norvegicus]	54	29	399
3909	1	1	273	gi|29865	ICENP-E (Homo sapiens)	54	30	273
3921	1	3	209	pir[S24325]S243	glucan 1,4-beta-glucosidase (EC 3.2.1.74) - Pseudomonas fluorescens subsp. cellulosa	54	34	207
4438	1	566	285	gi|1196657	unknown protein [Mycoplasma pneumoniae]	54	30	282
4459	1	3	272	gi|11046081	hypothetical protein (GB:D26195.10) [Mycoplasma genitalium]	54	38	270
4564	1	3	221	gi|216267	ORF2 [Bacillus megaterium]	54	38	219
23	12	12538	10685	gi|474192	lucC gene product [Escherichia coli]	53	35	1854
23	14	14841	13579	gi|62029	ORF1 gene product [Escherichia coli]	53	32	1263
24	3	4440	3940	gi|1369947	c2 gene product [Bacteriophage B1]	53	36	501
26	4	3818	4618	gi|1486247	unknown [Bacillus subtilis]	53	37	801
38	6	2856	3998	gi|405880	lye1 [Escherichia coli]	53	40	1143
38	10	9180	7806	gi|1399954	thyroid sodium/iodide symporter NIS [Rattus norvegicus]	53	29	1575
56	10	12324	12100	pir[A54592]A545	110K actin filam. associated protein - chicken	53	32	225
57	6	5047	4583	pir[A00361]DEZP	alcohol dehydrogenase (EC 1.1.1.1) - fission yeast [Schizosaccharomyces pombe]	53	39	465
57	12	10515	8932	gi|1480429	putative transcriptional regulator [Bacillus stearothermophilus]	53	30	1584
67	12	9496	10218	gi|1511555	quinolone resistance nraA protein protein [Methanococcus jannaschii]	53	31	723
69	3	3125	2382	gi|1687017	arabinogalactan-protein, AGP [Nicotiana glauca, cell-suspension culture filtrate, Peptide, 461 aa]	53	30	744
79	1	3	1031	gi|1523802	glucanase [Anabaena variabilis]	53	32	1039
80	1	673	338	gi|452428	ATPase 3 [Plasmodium falciparum]	53	36	336
88	4	1910	2524	gi|137034	ORP_0488 [Escherichia coli]	53	25	615
88	5	2467	3282	gi|137034	ORP_0488 [Escherichia coli]	53	29	816

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match	Accession	Match gene name	Sim	Ident	length (nt)
92	8	5870	5505	gi139598		amphotropic murine retrovirus receptor [Rattus norvegicus]	53	33	366
94	5	4417	3239	gi1173038		tropomyosin (TPM) [Saccharomyces cerevisiae]	53	25	1179
99	5	4207	5433	sp128246|BCR_E		IBICYCLONICIN RESISTANCE PROTEIN (SULFONAMIDE RESISTANCE PROTEIN)	53	30	1227
120	3	1639	2262	gi1576655		ORF1 [Vibrio anguillarum]	53	35	628
120	11	7257	8897	gi11524397		glycine betaine transporter Opd [Bacillus subtilis]	53	33	1641
127	6	6893	5685	gi11256630		putative [Bacillus subtilis]	53	32	1209
147	2	255	557	gi1581648		epib gene product [Staphylococcus epidermidis]	53	34	303
158	4	4705	4256	gi1151004		inucoidy regulatory protein AlgR [Pseudomonas aeruginosa] p1r[A32802|A32802 regulatory protein algR - Pseudomonas aeruginosa sp|P26275|ALOR_PSEAE POSITIVE ALGINATE BIOSYNTHESIS REGULATORY PROTEIN]	53	32	450
171	7	5717	5421	gi11510669		hypothetical protein (GP:D6404_18) [Methanococcus jannaschii]	53	34	297
191	9	11087	11483	gi1298085		acetoacetate decarboxylase [Clostridium acetobutylicum] p1r[B49346|B49346 butyrate-acetoacetate CoA-transferase (EC 2.8.3.9) small chain - Clostridium acetobutylicum sp|P33732|CTFA_CLOAB BUTYRATE-ACETOACETATE COA-TRANSFERASE SUBUNIT (EC 2.8.3.9) (COAT A)]	53	31	1605
203	5	3763	4326	gi1143456		proG protein (ttg start codon) [Bacillus subtilis]	53	29	564
206	17	18204	18971	gi1304136		acetylglutamate kinase [Bacillus stearothermophilus] sp|Q07905|ARGB_BACST ACETYLGLUTAMATE KINASE (EC 2.7.2.8) (NAG INASE) (AGK) (N-ACETYL-L-GLUTAMATE 5-PHOSPHOTRANSFERASE)]	53	36	768
212	10	4021	4221	gi119878		protein kinase [Plasmodium falciparum]	53	28	201
231	2	1580	1350	gi1537506		paramyosin [Dirofilaria immitis]	53	34	231
272	6	2719	3249	p1r[A33141|A331		hypothetical protein (gtfD 3' region) - Streptococcus mutans	53	34	531
308	3	927	2576	gi1608292		ORF_0696 [Escherichia coli]	53	33	1650
320	7	5645	5884	gi1160596		RNA polymerase III largest subunit [Plasmodium falciparum] sp|P27625|RPC1_PLAFA DNA-DIRECTED RNA POLYMERASE III LARGEST SUBUNIT (EC 2.7.7.6)]	53	33	240
327	1	218	901	gi1854601		unknown [Schizosaccharomyces pombe]	53	31	684
341	2	212	2500	gi1633732		ORF1 [Campylobacter jejuni]	53	31	2289
351	1	763	383	sp131675|VABM_		HYPOHETICAL 42.7 KD PROTEIN IN TSPA-LEUD INTERGENIC REGION (ORF104)	53	32	381
433	7	5087	4731	gi11001961		MHC class II analog [Staphylococcus aureus]	53	30	357
454	2	1240	980	p1r[A60328|A603		40K cell wall protein precursor (ar 5' region) - Streptococcus mutans (strain OH2175, serotype f)	53	27	261

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	RefSeq gene name	% sim	% ident	length (nt)
470	4	1123	1761	gi1516826	rat OCP360 [Rattus rattus]	53	30	639
483	1	432	217	gi11480429	putative transcriptional regulator [Bacillus stearothermophilus]	53	23	216
544	1	516	1259	gi146587	ORF 1 (AA 1 - 121) (1 is 2nd base in codon) [Staphylococcus aureus] ir[S15765]S15765 hypothetical protein 1 (hib 5' region) - aphylococcus aureus (fragment)	53	38	744
558	10	3957	3754	gi115140	lec gene [Bacteriophage P1]	53	32	204
603	2	339	620	gi1507738	Hep [Vibrio parahaemolyticus]	53	26	282
693	1	1669	941	gi1153123	toxic shock syndrome toxin-1 precursor [Staphylococcus aureus] pir[A28606]KCSA1 toxic shock syndrome toxin-1 precursor - taphylococcus aureus	53	38	729
766	1	2	673	gi1687600	orfA2: orfA2 forms an operon with orfA1 [Listeria monocytogenes]	53	43	672
781	1	667	335	gi11204551	ptilin biogenesis protein [Haemophilus influenzae]	53	26	333
801	1	3	545	gi11279400	SapA protein [Escherichia coli]	53	35	543
803	1	2	910	gi1695278	lipase-like enzyme [Alcaligenes eutrophus]	53	30	909
872	1	1177	590	gi1298032	EP [Streptococcus suis]	53	30	588
910	1	2	184	gi11044936	unknown [Schizosaccharomyces pombe]	53	29	183
943	1	794	399	gi1390508	similar to unidentified ORF near 47 minutes [Escherichia coli] sp|P1436|YICK_ECOLI HYPOTHETICAL 43.5 KD PROTEIN IN SELC-NUPA INTERGENIC REGION	53	30	396
988	1	1004	504	gi1142441	ORF 3: putative [Bacillus subtilis]	53	28	501
1064	1	3	434	gi1305080	myosin heavy chain [Entamoeba histolytica]	53	26	432
1366	1	3	452	gi1308852	transmembrane protein [Lactococcus lactis]	53	33	450
1758	1	792	397	gi11001774	hypothetical protein [Synchocystis sp.]	53	30	396
1897	1	1	447	gi1303949	Yqix [Bacillus subtilis]	53	27	447
2381	1	798	400	gi1146243	22.4% identity with Escherichia coli DNA-damage inducible protein ... putative [Bacillus subtilis]	53	37	399
3537	1	1	327	gi1450688	hscM gene of Ecopri gene product [Escherichia coli] pir[S38437]S38437 hscM protein - Escherichia coli pir[S09629]S09629 hypothetical protein A - Escherichia coli (SUB 40-520)	53	35	327
3747	2	137	397	gi11477486	transposase [Burkholderia cepacia]	53	53	261
11	5	3049	3441	gi1868224	No definition line found [Caenorhabditis elegans]	52	33	393

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
15	5	2205	2369	gi|215966	g41 protein (gag start codon) (Bacteriophage T4)	52	34	165
19	3	2429	3808	gi|1205379	UDP-murac-pentapeptide synthetase (Haemophilus influenzae)	52	31	1380
24	1	6920	3462	gi|579124	predicted 86.4kd protein; 52kd observed (Mycobacteriophage 15) p1r[S30971][S30971] gene 26 protein - Mycobacterium phage L5 ap[005233]VC26_RPM15 MINOR TAIL PROTEIN GP26. (SUB 2-837)	52	32	3459
37	5	3015	3935	gi|1500543	p15 protein (Methanococcus jannaschii)	52	25	921
38	13	8795	9703	gi|146851	glucose kinase (Streptomyces coelicolor)	52	29	909
44	16	110617	111066	gi|42012	moaB gene product (Escherichia coli)	52	36	450
46	1	3	521	gi|1040957	NADH dehydrogenase subunit 6 (Anopheles trinkae)	52	25	519
51	10	5531	6280	gi|388269	lcrC (Plasmid pAD1)	52	32	750
56	5	3968	2826	gi|181949	endothelial differentiation protein (edg-1) (Homo sapiens) p1r[A33300][A33300] G protein-coupled receptor edg-1 - human ap[21453]EDC1_HUMAN PROBABLE G PROTEIN-COUPLED RECEPTOR EDG-1.	52	23	1143
57	5	4850	4173	gi|304153	isobitol dehydrogenase (Bacillus subtilis)	52	27	678
62	5	3364	2870	gi|1072399	phaE gene product (Rhizobium meliloti)	52	25	495
62	6	4445	3651	gi|146485	NADH dehydrogenase (Synethococcus PCT942)	52	27	795
67	14	11355	112962	gi|1511365	glutamate synthase (NADPH), subunit alpha (Methanococcus jannaschii)	52	30	1608
67	21	16935	18158	gi|1204393	hypothetical protein (SP:P31122) (Haemophilus influenzae)	52	25	1224
70	4	2185	1997	gi|7227	cytoplasmic dynein heavy chain (Dictyostelium discoideum) F/A44357/A44357 dynein heavy chain, cytosolic - slime mold cytoskeleton (dictyostelium)	52	36	189
96	10	10005	10664	gi|1408485	1865G gene product (Bacillus subtilis)	52	26	660
103	5	3986	3351	gi|1009368	respiratory nitrate reductase (Bacillus subtilis)	52	42	636
109	3	4102	3350	gi|599274	labeS gene product (Mycobacterium leprae)	52	39	753
109	19	15732	17300	gi|1526981	amino acid permease YaeF like protein (Salmonella typhimurium)	52	30	1569
121	3	1412	981	gi|732931	unknown (Saccharomyces cerevisiae)	52	32	432
125	3	865	1680	gi|1296975	put gene product (porphyromonas gingivalis)	52	38	816
130	2	659	1807	gi|1256634	25.8% identity over 120 aa with the Synenococcus sp. MpaV protein; putative (Bacillus subtilis)	52	36	1149
149	1	1164	583	gi|1225943	PBSX terminalase (Bacillus subtilis)	52	31	582
149	14	4687	4415	gi|1510368	M. jannaschii predicted coding region M0272 (Methanococcus jannaschii)	52	35	273

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
167	1	216	1001	gi1146025	cell division protein [Escherichia coli]	52	43	786
188	1	120	1256	gi1474915	orf 337; translated orf similarity to SW: ACR-ECOLI bicyclicacylin resistance protein of Escherichia coli [Coxiella burnetii] pir[SA4207]SA4207 hypothetical protein 337 - Coxiella burnetii (SUB-338)	52	26	1137
195	9	9161	8760	gi13028	mitochondrial outer membrane 72K protein [Neurospora crassa] r[A3682]A3682 72K mitochondrial outer membrane protein - rosopora crassa	52	25	402
200	3	2065	2607	gi1142439	ATP-dependent nuclease [Bacillus subtilis]	52	35	543
203	4	2776	3684	gi11303698	BLTD [Bacillus subtilis]	52	25	909
227	8	5250	5651	gi1305080	myosin heavy chain [Entamoeba histolytica]	52	24	402
242	1	21	1424	gi1060877	EmrV [Escherichia coli]	52	32	1404
249	5	4526	4753	pir[C37222]C372	cytochrome P450 1A1, hepatic - dog (fragment)	52	23	228
255	1	2107	1055	gi1143290	penicillin-binding protein [Bacillus subtilis]	52	28	1053
276	7	3963	3664	gi11001610	hypothetical protein [Synchocystis sp.]	52	30	300
276	8	4456	4055	gi1416235	orf L3 [Mycoplasma capricolum]	52	26	402
289	2	1856	1449	gi1150900	GTP phosphohydrolase [Proteus vulgaris]	52	34	408
325	1	1	279	gi1204874	polypeptide deformylase (formylmethionine deformylase) [Haemophilus influenzae]	52	33	279
340	1	2017	1010	gi11215695	peptide transport system protein SapF homolog; SapF homolog [Mycoplasma pneumoniae]	52	33	1008
375	3	340	1878	gi1467446	similar to SpoVB [Bacillus subtilis]	52	28	1539
424	4	4104	3262	gi11478239	unknown [Mycobacterium tuberculosis]	52	34	843
430	1	3	575	pir[A42606]A426	orfA 5' to orf405 - Saccharopolyspora erythraea (fragment)	52	28	573
444	4	4728	3712	gi11408494	homologous to penicillin acylase [Bacillus subtilis]	52	31	1017
465	1	1802	903	gi1143331	alkaline phosphatase regulatory protein [Bacillus subtilis] pir[A27650]A27650 regulatory protein phoR - Bacillus subtilis sp|P23545|PHOR_BACSU ALKALINE PHOSPHATASE SYNTHESIS SENSOR PROTEIN PHOR (BC 2.7.3.-)	52	36	900
469	5	4705	4169	gi1755152	highly hydrophobic integral membrane protein [Bacillus subtilis] sp|P42953|TAGO_BACSU TETRAOIC ACID TRANSLATION PERMEASE PROTEIN AGO.	52	32	537
495	1	1262	633	gi11204607	transcription activator [Haemophilus influenzae]	52	25	630
505	7	6004	5762	gi1142440	ATP-dependent nuclease [Bacillus subtilis]	52	28	243

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
517	2	1162	1614	gi|166162	Bacteriophage phi-11 int gene activator (Staphylococcus acteriophage phi 11)	52	35	453
543	2	444	1295	gi|1215693	putative orf: ORF09434 (Mycoplasma pneumoniae)	52	25	852
586	1	1	336	gi|581648	epib gene product (Staphylococcus epidermidis)	52	36	336
773	1	848	426	gi|1279769	PdHC (Methanobacterium thermoformicum)	52	30	423
1120	2	100	330	gi|142439	ATP-dependent nuclease (Bacillus subtilis)	52	35	231
1614	1	691	347	gi|289262	comE ORF3 (Bacillus subtilis)	52	28	345
2495	1	1	324	gi|216151	DNA polymerase (gene L; tlg start codon) (Bacteriophage SP02) gi|579197 SP02 DNA polymerase (aa 1-648) (Bacteriophage SP02) p1r|A21498|DJBPS2 DNA-directed DNA polymerase (EC 2.7.7.7) - phage P02	52	34	324
2931	1	566	285	gi|1256136	YbbG (Bacillus subtilis)	52	30	282
2943	1	577	320	gi|41713	hlsA ORF (AA 1-245) (Escherichia coli)	52	35	258
2993	1	588	295	gi|298032	EP (Streptococcus suis)	52	34	294
3667	1	612	307	gi|849025	hypothetical 64.7-kDa protein (Bacillus subtilis)	52	36	306
3944	1	478	260	gi|1218040	BAA (Bacillus licheniformis)	52	36	219
3954	2	613	347	gi|854064	US7 (human herpesvirus 6)	52	50	267
3986	1	90	401	gi|1205919	Na ⁺ and Cl ⁻ dependent gamma-aminobutyric acid transporter (Haemophilus influenzae)	52	33	312
4002	1	3	389	gi|40003	oxoglutarate dehydrogenase (NADP+) (Bacillus subtilis) p1p23129|OD01.BACSU 2-OXOGLUTARATE DEHYDROGENASE E1 COMPONENT (EC 2.4.2) (ALPHA-KETOGLUTARATE DEHYDROGENASE)	52	42	387
4020	1	1	249	gi|159388	ornithine decarboxylase (Leishmania donovani)	52	47	249
4098	1	438	220	gi|408795	No definition line found (Escherichia coli)	52	32	219
4248	1	3	212	gi|965077	Adr6p (Saccharomyces cerevisiae)	52	40	210
7	1	3	575	gi|895747	putative cel operon regulator (Bacillus subtilis)	51	28	573
21	4	2479	3276	gi|1510962	indole-3-glycerol phosphate synthase (Methanococcus jannaschii)	51	32	798
22	9	5301	5966	gi|1303933	YqjW (Bacillus subtilis)	51	25	666
43	3	1516	1283	gi|1519460	Srp1 (Schizosaccharomyces pombe)	51	31	234
44	17	11042	11305	gi|42011	moad gene product (Escherichia coli)	51	35	264
51	11	6453	6731	gi|495471	vacuolating toxin (Helicobacter pylori)	51	37	279

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
52	4	2537	2995	gi11256652	25% identity to the E.coli regulatory protein MprA; putative [Bacillus subtilis]	51	32	459
57	10	7331	6843	gi1508173	B17A domain of PTS-dependent Gnt transport and phosphorylation [Escherichia coli]	51	32	489
59	1	29	1111	gi1299163	alanine dehydrogenase [Bacillus subtilis]	51	33	1083
67	20	15791	16576	gi11310977	M. jannaschii predicted coding region M0938 [Methanococcus jannaschii]	51	24	786
69	2	1559	1218	gi1467359	[unknown [Bacillus subtilis]]	51	34	342
71	1	3	1196	gi1298032	GP [Streptococcus suis]	51	32	1194
78	2	349	176	gi11161242	proliferating cell nuclear antigen [Styela clava]	51	28	174
99	4	3357	4040	gi1642795	TFIID subunit TAFII55 [Homo sapiens]	51	25	684
109	1	2852	1428	gi1580920	rodD (gtaA) polypeptide (AA 1-673) [Bacillus subtilis] pir[S06048]S06048 probable rodD protein - Bacillus subtilis sp[P13484]TAGE_BACSU PROBABLE POLYGLYCEROL-PHOSPHATE) LPGA-GLUCOSYLTRANSFERASE (EC 2.4.1.52) (TECHNOIC ACID BIOSYNTHESIS PROTEIN E)	51	27	1425
109	9	6007	6693	gi11204815	hypothetical protein (SP:P32662) [Haemophilus influenzae]	51	23	687
112	3	1066	2352	gi1505330|S053	maltose-binding protein precursor - Enterobacter aerogenes	51	42	1287
112	13	14432	12855	gi1405857	[yeno [Escherichia coli]]	51	29	1578
114	9	9725	8967	gi1435098	orf1 [Mycoplasma capricolum]	51	30	759
115	1	1	912	gi1141110	ORF Y10L087w [Saccharomyces cerevisiae]	51	29	912
127	10	9647	10477	gi11204314	M. influenzae predicted coding region HI0056 [Haemophilus influenzae]	51	37	831
152	9	6814	7356	gi1431929	Hunt regulatory protein [Mycoplasma sp.]	51	38	543
154	2	575	1153	gi11237044	[unknown [Mycobacterium tuberculosis]]	51	36	579
154	7	6587	5634	gi1409286	[barD [Bacillus subtilis]]	51	27	954
171	6	6943	6236	gi11205484	hypothetical protein (SP:P33918) [Haemophilus influenzae]	51	32	708
184	1	1	291	gi1466886	[B1496_C1_206 [Mycobacterium leprae]]	51	33	291
212	5	1501	2139	gi1405605|A456	mature-parasite-infected erythrocyte surface antigen MESA - Plasmodium falciparum	51	23	639
228	2	707	1378	gi18204	nuclear protein [Drosophila melanogaster]	51	27	672
236	6	8137	7481	gi149272	[Aspergillus [Bacillus licheniformis]]	51	31	657
243	4	4637	3546	gi11511102	[melvalonate kinase [Methanococcus jannaschii]]	51	29	1092

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
257	4	3540	3773	gi|204579	H. influenzae predicted coding region H10326 [Haemophilus influenzae]	51	22	168
258	3	2397	1609	gi|160299	glutamic acid-rich protein (Plasmodium falciparum) p1c|A54514|A54514 glutamic acid-rich protein precursor - Plasmodium falciparum	51	34	789
265	5	2419	3591	gi|580841	F1 [Bacillus subtilis]	51	32	1173
298	2	518	748	gi|1336162	SCP8 [Streptococcus agalactiae]	51	34	231
316	9	5817	7049	gi|413953	ipa-29d gene product [Bacillus subtilis]	51	39	1233
332	2	3775	2057	gi|209012	mutS [Thermus aquaticus thermophilus]	51	26	1719
364	4	3816	4991	gi|528991	unknown [Bacillus subtilis]	51	32	1176
440	2	448	684	gi|2819	transferase (GNL10) (AA 1 - 687) [Kluyveromyces lactis] r|501407|XUVKG UDP-glucose 4-epimerase (EC 5.1.3.2) - yeast uyveromyces marxianus var. lactis)	51	32	237
495	2	1353	1177	gi|297861	protease G [Erwinia chrysanthemi]	51	41	177
495	3	2287	1718	gi|1513317	serine rich protein [Entamoeba histolytica]	51	25	570
506	1	840	421	gi|455320	cif protein [Bacteriophage P4]	51	33	420
600	1	1474	983	gi|587532	orf, len: 201, CAT: 0.16 [Saccharomyces cerevisiae] pir|S48818|S48818 hypothetical protein - yeast (Saccharomyces erevisiae)	51	30	492
607	3	479	934	gi|3511524	hypothetical protein (SP:P37002) [Methanococcus jannaschii]	51	40	456
686	2	127	600	gi|493017	endocarditis specific antigen [Enterococcus faecalis]	51	30	474
726	1	33	230	gi|1353851	unknown [Prochlorococcus marinus]	51	45	198
861	1	176	652	gi|410145	dihydroquinone dehydratase [Bacillus subtilis]	51	34	477
869	1	782	393	gi|40100	rodC (tag3) polypeptide (AA 1-746) [Bacillus subtilis] ir|S06049|S06049 rodC protein - Bacillus subtilis p|P13485|TAGP_BACSU TECHOIC ACID BIOSYNTHESIS PROTEIN F.	51	23	390
1003	1	642	322	gi|1279707	hypothetical phosphoglycerate mutase [Saccharomyces cerevisiae]	51	39	321
1046	2	866	624	gi|510257	glycosyltransferase [Escherichia coli]	51	29	243
1467	1	702	352	gi|1511175	M. jannaschii predicted coding region M1177 [Methanococcus jannaschii]	51	32	351
2558	1	457	210	gi|10582|DPOM_	DNA POLYMERASE (EC 2.7.7.7) (S-1 DNA ORF 3).	51	26	228
3003	1	779	399	gi|809543	[CbrC protein [Erwinia chrysanthemi]	51	27	381
3604	1	1	399	gi|JCE210|JC42	3-hydroxyacyl-CoA dehydrogenase (EC 1.1.1.35) - mouse	51	37	399
3732	1	2	316	gi|145906	acyl-CoA synthetase [Escherichia coli]	51	33	315

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
3791	1	2	274	gi|1061351	jaemaphorin III family homolog (Homo sapiens)	51	37	273
3995	1	46	336	gi|216346	surfactin synthetase (Bacillus subtilis)	51	38	291
4193	1	612	307	gi|42749	ribosomal protein L12 (AA 1-179) [Escherichia coli] tr|S04776|XXECP1 peptide N-acetyltransferase rimL (EC 2.3.1.-) - chetichia coli	51	25	306
4539	1	367	185	gi|1408494	homologous to penicillin acylase (Bacillus subtilis)	51	60	183
4562	1	442	219	gi|1438280	coded for by C. elegans cDNA cm01a7; Similar to hydroxymethylglutaryl-CoA synthase (Caenorhabditis elegans)	51	35	204
1	4	3576	4859	gi|559160	GRAIL score: null; cap site and late promoter motifs present putrease; putative (Autographa californica nuclear polyhedrosis virus)	50	44	1284
11	7	4044	5165	gi|1146207	putative (Bacillus subtilis)	50	35	1122
11	13	10309	9496	gi|1208451	hypothetical protein (Synecocystis sp.)	50	39	1014
19	1	2034	1018	gi|413966	ipa-42d gene product (Bacillus subtilis)	50	29	1017
20	11	8586	8407	gi|1323159	ORF YGR103W (Saccharomyces cerevisiae)	50	28	180
24	5	5408	4824	gi|496280	structural protein (Bacteriophage Tuc2009)	50	29	585
34	4	1926	2759	gi|1303966	Yqj0 (Bacillus subtilis)	50	36	834
38	30	22865	23440	gi|1072179	Similar to dihydroflavonol-4-reductase (maize, petunia, tomato) (Caenorhabditis elegans)	50	32	576
47	2	1705	2976	gi|153015	FemA protein (Staphylococcus aureus)	50	29	1272
56	13	15290	15841	gi|606096	ORF_167; end overlaps end of o100 by 14 bases; start overlaps f174, ther starts possible [Escherichia coli]	50	30	562
57	1	2135	1077	gi|640922	xylicol dehydrogenase (unidentified hemiascomycete)	50	29	1059
58	2	628	1761	gi|143725	putative (Bacillus subtilis)	50	29	1134
88	6	4393	3884	gi|1072179	Similar to dihydroflavonol-4-reductase (maize, petunia, tomato) (Caenorhabditis elegans)	50	32	510
89	5	3700	3356	gi|1276658	ORF174 gene product (Porphyra purpurea)	50	25	345
141	1	3	239	gi|476024	carbamoyl phosphate synthetase II (Plasmodium falciparum)	50	33	237
151	1	186	626	gi|1403441	unknown (Mycobacterium tuberculosis)	50	35	441
166	7	11065	9623	gi|895747	putative col operon regulator (Bacillus subtilis)	50	32	1443
201	6	5284	5096	gi|160229	circumsporozoite protein (Plasmodium reichenowi)	50	42	189
206	22	30784	29555	gi|1052754	LarP integral membrane protein (Lactococcus lactis)	50	24	1230

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	seq gene name	% sim	% ident	length (nt)
211	4	1523	1927	gi1410131	OREX7 (Bacillus subtilis)	50	29	405
214	4	2411	3295	ep137348|VECE	HYPOTHETICAL PROTEIN IN ASP5 5' REGION (FRAGMENT)	50	37	885
228	7	5068	4406	gi1313580	envelope protein (Human immunodeficiency virus type 1) p1r(S35835)S35835 envelope protein - human immunodeficiency virus type 1 (fragment) (SUB 1-77)	50	35	663
272	2	3048	1723	gi11408485	B65G gene product (Bacillus subtilis)	50	22	1326
273	2	1616	984	gi11741186	phosphoglycerate mutase (Saccharomyces cerevisiae)	50	28	613
328	2	2507	1605	gi1148896	lipoprotein (Haemophilus influenzae)	50	26	903
332	4	5469	3802	gi11526547	DNA polymerase family X (Thermus aquaticus)	50	27	1668
342	5	3473	3931	gi1456562	C-box binding factor (Dictyostelium discoideum)	50	35	459
352	1	1478	741	gi1288301	ORE2 gene product (Bacillus megaterium)	50	29	738
408	7	5299	5523	gi111665	ORF2136 (Marchantia polymorpha)	50	27	225
420	3	650	1825	gi1757842	UDP-sugar hydrolase (Escherichia coli)	50	30	1176
464	1	1	591	gi1487282	Na ⁺ -ATPase subunit J (Enterococcus hirae)	50	29	591
472	2	1418	864	gi1531875	BglR (Lactococcus lactis)	50	23	555
520	1	23	541	gi1567036	CapB (Staphylococcus aureus)	50	27	519
529	1	6	410	gi1256652	25% identity to the E.coli regulatory protein MprA; putative (Bacillus subtilis)	50	34	405
534	5	7726	6059	gi1295671	selected as a weak suppressor of a mutant of the subunit AC40 of DNA dependent RNA polymerase I and III (Saccharomyces cerevisiae)	50	18	1668
647	1	2990	1497	gi1405568	Tral protein shares sequence similarity with a family of opsinases (Plasmodium falciparum)	50	31	1494
664	3	1133	711	gi1410007	leukocidin F component (Staphylococcus aureus, MRSA No. 4, peptide, 23 aa)	50	32	423
678	1	1	627	gi1238032	EF (Streptococcus suis)	50	29	627
755	3	947	1171	gi1150572	cytochrome c precursor (EC 1.10.2.2) (Paracoccus denitrificans) gi145465 cytochrome c1 (AA 1-450) (Paracoccus denitrificans) p1r[C29413]C29413 ubiquinol-cytochrome-c reductase (EC 1.10.2.2) cytochrome c1 precursor - Paracoccus denitrificans sp|P1562|CY1	50	37	225
827	1	1363	683	gi1142020	heterocyst differentiation protein (Anabaena sp.)	50	21	681
892	1	3	752	gi1408485	B65G gene product (Bacillus subtilis)	50	27	750
910	2	438	887	gi11104727	tyrosine-specific transport protein (Haemophilus influenzae)	50	25	450

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	length (nt)
913	1	524	760	gi|1205451	cell division inhibitor [Haemophilus influenzae]	50	32	237
973	1	424	236	gi|886947	orf3 gene product [Saccharomyces cerevisiae]	50	40	189
1009	1	653	429	gi|153727	M protein [group G streptococcus]	50	28	225
1027	1	511	257	gi|413934	tpe-10r gene product [Bacillus subtilis]	50	25	255
1153	2	556	326	gi|773876	ncxa [Alcaligenes xyloxydane]	50	36	231
1222	1	798	400	gi|1408485	B65G gene product [Bacillus subtilis]	50	21	399
1350	1	692	399	gi|289272	ferrichrome-binding protein [Bacillus subtilis]	50	32	294
2945	1	366	184	gi|171704	hexaprenyl pyrophosphate synthetase (COQ1) [Saccharomyces erevisiae]	50	34	183
2968	2	1604	804	gi|397526	clumping factor [Staphylococcus aureus]	50	33	801
2998	2	657	394	gi|495696	F54E7.3 gene product [Caenorhabditis elegans]	50	40	264
3046	2	506	306	gi|513819|S138	acyl carrier protein - Anabaena variabilis (fragment)	50	32	201
3063	1	547	275	gi|174190	lucA gene product [Escherichia coli]	50	29	273
3174	1	3	146	gi|151900	alcohol dehydrogenase [Rhodospirillum rubrum]	50	31	144
3792	1	625	314	gi|1001423	hypothetical protein [Synecocystis sp.]	50	35	312
3800	1	2	262	gi|144733	NAD-dependent beta-hydroxybutyryl coenzyme A dehydrogenase Clostridium acetobutylicum	50	28	261
3946	1	173	188	gi|576765	cytochrome b [Myrmecia pilosula]	50	38	186
3984	1	578	291	ep|P37348|YECE	HYPOTHETICAL PROTEIN IN ASPS 5-REGION (FRAGMENT)	50	37	288
37	10	8250	7885	gi|1204167	hypothetical protein [GB:U14003.278] [Haemophilus influenzae]	49	30	366
46	16	113802	14848	gi|466860	lact; B1308_F1_34 [Mycobacterium leprae]	49	24	1047
59	5	2287	3601	gi|606304	ORF_042 [Escherichia coli]	49	27	1335
112	18	17884	18615	gi|559502	MD4 protein (AA 1 - 409) [Caenorhabditis elegans]	49	25	732
138	9	6973	7902	gi|303953	esterase [Acinetobacter calcoaceticus]	49	29	930
217	6	4401	5138	gi|496254	fibrinectin/fibrinogen-binding protein [Streptococcus pyogenes]	49	31	738
220	12	11803	12657	gi|397526	clumping factor [Staphylococcus aureus]	49	31	855
228	4	1842	2492	gi|521692|S236	hypothetical protein 9 - Plasmodium falciparum	49	24	651
268	1	5016	2614	gi|143047	ORF8 [Bacillus subtilis]	49	26	2403

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
271	2	1164	1373	gi|1001257	hypothetical protein [Synecocystis sp.]	49	38	210
300	3	4340	3180	gi|1510796	hypothetical protein (GPX91006.2) [Methanococcus jannaschii]	49	26	1161
381	1	2281	1142	gi|396301	matches PS00041: Bacterial regulatory proteins, arc family signature [Escherichia coli]	49	29	1140
466	1	3	947	gi|1303863	Yqgp [Bacillus subtilis]	49	26	945
666	1	379	191	gi|633112	ORF1 [Streptococcus sobrinus]	49	29	189
670	2	403	1014	gi|1122758	unknown [Bacillus subtilis]	49	32	612
709	1	1433	795	gi|141830	xpaC [Bacillus subtilis]	49	29	639
831	1	943	473	gi|401786	phosphomannomutase [Mycoplasma pirum]	49	29	471
1052	1	422	213	gi|1303799	Yqen [Bacillus subtilis]	49	21	210
1800	1	342	172	gi|216300	peptidoglycan synthesis enzyme [Bacillus subtilis] sp|P37505|MURG_BACSU MURG PROTEIN UPD-N-ACETYLGLUCOSAMINE-N-ACETYLGLUCOSAMINE- PENTAPEPTIDE) PYROPHOSPHORYL-UNDECAPRENOL N-ACETYLGLUCOSAMINE RANSPERASE).	49	28	171
2430	1	2	376	sp|P27434|YFGA_	HYPOTHETICAL 36.2 KD PROTEIN IN NDK-GCPE INTERGENIC REGION.	49	26	375
3096	1	542	273	gi|516360	surfactin synthetase [Bacillus subtilis]	49	25	270
32	4	3771	3100	gi|1217963	hepatocyte nuclear factor 4 gamma (HNF4gamma) [Homo sapiens]	48	36	672
38	1	1	609	gi|205790	H. influenzae predicted coding region H1555 [Haemophilus influenzae]	48	28	609
45	6	5021	6427	gi|1534267	unknown [Mycobacterium tuberculosis]	48	20	1407
59	14	16346	31096	gi|1197336	Lmp3 protein [Mycoplasma hominis]	48	28	14751
61	1	3	608	gi|1511555	quinolone resistance nra protein [Methanococcus jannaschii]	48	30	606
61	3	3311	3646	gi|1303893	YqkL [Bacillus subtilis]	48	29	336
114	1	98	415	gi|671708	su(s) homolog: similar to Drosophila melanogaster suppressor of able (su(s)) protein, Swiss-Prot Accession Number P22293 [Drosophila virilis]	48	25	318
121	1	1131	610	gi|1314584	unknown [Sphingomonas S88]	48	29	522
136	1	2014	1280	gi|1205968	H. influenzae predicted coding region H1738 [Haemophilus influenzae]	48	23	735
171	110	8220	9557	gi|1208454	hypothetical protein [Synecocystis sp.]	48	34	1338
175	1	3625	1814	gi|396400	similar to eukaryotic Na+/H+ exchangers [Escherichia coli] sp|P32703|YJCE_ECOLI HYPOTHETICAL 60.5 KD PROTEIN IN SOXR-ACS INTERGENIC REGION (0549).	48	29	1812
194	1	2	385	gi|1510493	H. jannaschii predicted coding region M00419 [Methanococcus jannaschii]	48	25	384

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	major gene name	% sim	% ident	length (nt)
197	1	901	452	gi11045714	[spermidine/putrescine transport ATP-binding protein [Mycoplasma genitalium]	48	25	650
203	1	1	396	gi1940288	[protein localized in the nucleoli of pea nuclei; ORF; putative Pisum sativum]	48	29	396
204	1	1363	698	gi1529202	[no definition line found [Caenorhabditis elegans]	48	25	666
206	120	134815	27760	gi1511490	[oramycin S synthetase 2 [Bacillus brevis]	48	27	7056
212	1	2	166	gi1295899	[nucleolin [Menopus laevis]	48	34	165
220	110	112652	11426	gi144073	[SecY protein [Lactococcus lactis]	48	23	1227
243	6	6450	5491	gi11184118	[methylglutamate kinase [Methanobacterium thermoautotrophicum]	48	30	960
264	4	5434	3308	gi11015903	[ORF YJR15C [Saccharomyces cerevisiae]	48	26	2127
441	1	1532	768	gi1142863	[replication initiation protein [Bacillus subtilis] pir-[B26580][B26580 replication initiation protein - Bacillus subtilis]	48	23	765
444	5	3898	5298	gi1145836	[putative [Escherichia coli]	48	24	1401
444	2	388	1110	gi1146551	[transmembrane protein (kdp) [Escherichia coli]	48	18	723
542	3	1425	2000	pir-[528569]3289	[N-carbamoylserine amidohydrolase (EC 3.5.1.59) - Arthrobacter sp.	48	27	576
566	1	3	1019	gi1153490	[tetracycline C resistance and export protein [Streptomyces laevis]	48	24	1017
611	1	2	730	gi1103507	[unknown [Schizosaccharomyces pombe]	48	38	729
624	1	1255	665	gi1144859	[ORF B [Clostridium perfringens]	48	26	591
846	1	1014	508	gi1537506	[paraoxin [Dirofilaria immitis]	48	27	507
1020	1	66	950	gi11499876	[magnesium and cobalt transport protein [Methanococcus jannaschii]	48	30	845
1227	1	1	174	gi1493730	[lipoygenase [Pisum sativum]	48	35	174
1266	1	1	405	gi1682452	[ORF f211; alternate name yggA; orf5 of K14436 [Escherichia coli] gi141425 ORF5 (AA 1-197) [Escherichia coli] (SUB 15-211)]	48	24	405
2071	1	707	381	gi11408486	[HS74A gene product [Bacillus subtilis]	48	25	327
2398	1	463	233	gi1500401	[reverse gyrase [Methanococcus jannaschii]	48	40	231
2425	1	476	246	pir-[H48563]H485	[Cl protein - fowlpox virus (strain HP444) (fragment)]	48	40	231
2432	1	446	225	gi11353703	[Trio [Homo sapiens]	48	33	222
2453	1	794	399	gi1142850	[division initiation protein [Bacillus subtilis]	48	29	396
2998	1	469	236	gi1577569	[PepV [Lactobacillus delbrueckii]	48	31	234

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
3042	1	14	280	gi|945219	luciferase (Homo sapiens)	48	35	267
3686	1	1	405	gi|145836	putative [Escherichia coli]	48	25	405
4027	2	492	301	pir.S51177|S511	trans-activator protein - Equine infectious anemia virus	48	32	192
4	2	3641	2232	gi|1303989	[YqkI (Bacillus subtilis)]	47	24	1410
24	2	599	1084	gi|1540083	PC4-1 gene product (Bradyzia hygdal)	47	28	486
36	10	7524	6925	gi|1209223	esterase (Acinetobacter lwoffii)	47	26	500
43	2	196	1884	gi|1403455	unknown (Mycobacterium tuberculosis)	47	27	1689
44	22	16118	15108	gi|1511555	quinolone resistance norA protein protein (Methanococcus jannaschii)	47	31	1011
69	7	7141	6710	gi|438466	Possible operon with orfG. Hydrophilic, no homologue in the database; putative (Bacillus subtilis)	47	29	432
81	4	5022	4279	gi|466682	ppsl: 81496.C2.189 (Mycobacterium leprae)	47	24	744
120	12	9135	8863	gi|927340	D9509.27p; CAI: 0.12 (Saccharomyces cerevisiae)	47	38	273
142	1	2022	1174	gi|486143	ORF YKL094w (Saccharomyces cerevisiae)	47	32	849
168	1	2178	1093	gi|1177254	hypothetical Ecob protein (Bacillus subtilis)	47	29	1086
263	1	1884	943	gi|142822	O-alanine racemase cds (Bacillus subtilis)	47	34	942
279	1	1109	561	gi|516608	2 predicted membrane helices. homology with B. subtilis men Orf3 Rowland et. al. unpublished Accession number M74183, approximately 1 minutes on updated Rudi map; putative (Escherichia coli) sp|p37355|VFBB_ECOLI_HYPOTHETICAL_26.7_KD PROTEIN IN MEND-MEND	47	31	549
345	2	2620	1676	gi|1204835	hippuricase (Haemophilus influenzae)	47	28	945
389	2	152	400	gi|456562	G-box binding factor (Dictyostellum discoideum)	47	32	249
391	1	1	831	gi|1420856	myo-inositol transporter (Schizosaccharomyces pombe)	47	19	831
404	3	2072	2773	gi|1255425	C33G8.2 gene product (Caenorhabditis elegans)	47	17	702
529	5	2145	3107	gi|1303973	YqjV (Bacillus subtilis)	47	29	963
565	2	2321	1257	gi|142824	processing protease (Bacillus subtilis)	47	28	1065
654	1	962	483	gi|243353	ORF 5' of ECRF3 (herpesvirus saimiri) NVS, host-acquired monkey, eptide, 407 aa	47	23	480
692	1	115	633	gi|150756	40 kDa protein (Plasmid pM1)	47	25	519
765	1	1634	819	gi|1256621	26.7% of identity in 165 aa to a Thermophilic bacterium hypothetical protein 6; putative (Bacillus subtilis)	47	28	816

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	Match accession	Match gene name	% sim	% ident	Length (nt)
825	2	211	1023	gi|397526	clumping factor (Staphylococcus aureus)	47	32	813
914	1	1	615	gi|558073	polymorphic antigen (Pleomorphism falciparum)	47	29	615
1076	1	1	753	gi|1147557	Aspartate aminotransferase (Bacillus circulans)	47	33	753
1351	1	793	398	gi|755153	ATP-binding protein (Bacillus subtilis)	47	20	396
4192	1	3	293	gi|145836	putative (Escherichia coli)	47	24	291
5	6	4708	4361	gi|305080	myosin heavy chain (Entamoeba histolytica)	46	30	348
11	4	2777	3058	gi|603639	Yel040p (Saccharomyces cerevisiae)	46	28	282
46	11	10518	10100	gi|1246901	ATP-dependent DNA ligase (Candida albicans)	46	28	219
61	4	3941	7930	gi|298032	EF (Streptococcus suis)	46	35	3920
132	4	5028	4093	gi|1511057	hypothetical protein SP-P45869 (Methanococcus jannaschii)	46	25	936
170	4	4719	3652	pir|551910|5519	G4 protein - Sauroleishmania tarentolae	46	26	1068
191	7	9543	8284	gi|1041334	P5405.7 (Caenorhabditis elegans)	46	25	1260
253	1	1	396	gi|1204449	dihydrolipoamide acetyltransferase (Haemophilus influenzae)	46	35	396
264	3	437	973	gi|180189	cerebellar-degeneration-related antigen (CDR34) (Homo sapiens)	46	29	537
273	1	485	285	gi|607573	envelope glycoprotein (HIV) region (Human immunodeficiency virus type 1)	46	35	201
350	1	3	563	gi|537052	ORF_1286 (Escherichia coli)	46	35	561
384	1	2	862	gi|1221884	(urea?) amidolyase (Haemophilus influenzae)	46	31	861
410	4	1876	2490	gi|1110518	proton antiporter efflux pump (Mycobacterium smegmatis)	46	24	615
432	1	2663	1455	gi|1197634	orf4; putative transporter; Method: conceptual translation supplied by author (Mycobacterium smegmatis)	46	27	1209
458	1	2419	1211	gi|154870	portal protein (Bacteriophage SPPI)	46	30	1209
517	5	2477	4192	gi|1523812	orf5 (Bacteriophage A2)	46	23	1716
540	3	1512	1285	gi|215635	pacA (Bacteriophage P1)	46	30	228
587	2	649	1242	gi|537148	ORF_181 (Escherichia coli)	46	29	594
1218	1	747	391	gi|1205456	single-stranded-DNA-specific exonuclease (Haemophilus influenzae)	46	30	357

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% Ident	length (nt)
365	1	1	402	gi|450688	hadM gene of Ecoprr1 gene product [Escherichia coli] pir|S38437|S38437 hadM protein - Escherichia coli pir|S09629|S09629 hypothetical protein A - Escherichia coli (SUB 40-520)	46	33	402
4176	1	673	338	gi|951460	PIM-C.1 gene product [Xenopus laevis]	46	31	336
37	7	4813	5922	gi|606064	ORF_408 [Escherichia coli]	45	24	1110
38	116	11699	12004	gi|452192	protein tyrosine phosphatase (PTP-BAS, type 2) [Homo sapiens]	45	24	306
87	2	1748	2607	gi|1068813	homologous to sp:PHOR_BACSU [Bacillus subtilis]	45	23	660
103	12	14182	13385	gi|1001307	hypothetical protein (Synchocystis sp.)	45	22	798
112	14	14791	13811	gi|1204389	H. influenzae predicted coding region H10131 [Haemophilus influenzae]	45	23	981
145	4	4483	3462	gi|220578	open reading frame [Mus musculus]	45	20	1023
170	6	6329	4965	gi|238657	AppC-cytochrome d oxidase, subunit I homolog [Escherichia coli, K12, epsilon, 514 aa]	45	27	1365
206	2	5230	4346	gi|1222056	aminotransferase [Haemophilus influenzae]	45	27	885
228	1	60	716	gi|160299	glutamic acid-rich protein [Plasmodium falciparum] pir|A34514|A34514 glutamic acid-rich protein precursor - Plasmodium falciparum	45	23	657
288	1	2	1015	gi|1255425	C3368.2 gene product [Caenorhabditis elegans]	45	23	1014
313	3	4339	3128	gi|581140	NADH dehydrogenase [Escherichia coli]	45	30	1212
332	1	914	459	gi|870966	P47A4.2 [Caenorhabditis elegans]	45	20	456
344	1	3	221	gi|171225	kinesin-related protein [Saccharomyces cerevisiae]	45	26	219
441	2	1501	1073	gi|162863	replication initiation protein [Bacillus subtilis] pir|B26580|B26580 replication initiation protein - Bacillus subtilis	45	27	429
672	1	2	982	gi|1511334	M. jannaschii predicted coding region MJ1323 [Methanococcus jannaschii]	45	22	981
763	3	1345	851	gi|606180	ORF_310 [Escherichia coli]	45	24	495
886	3	379	846	gi|726426	similar to protein kinases and C. elegans proteins F37C12.8 and 37C12.5 [Caenorhabditis elegans]	45	30	468
948	1	3	473	gi|156400	myosin heavy chain (isozyme unc-54) [Caenorhabditis elegans] pir|A33958|MWK myosin heavy chain B - Caenorhabditis elegans sp|P03566|MYSB_CABEL MYOSIN HEAVY CHAIN B (MHC B)	45	25	471
1158	1	2	376	gi|441155	renin-inhibiting target antigen [Plasmodium falciparum]	45	35	375
2531	1	4	285	gi|1276705	ORF287 gene product [Porphyra purpurea]	45	28	282
3967	1	42	374	gi|976025	HraA [Escherichia coli]	45	28	333

TABLE 2

S. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% ident	length (nt)
52	7	6931	5846	gi|467378	unknown [Bacillus subtilis]	44	22	1086
138	8	6475	6849	gi|173028	thioredoxin II [Saccharomyces cerevisiae]	44	28	375
221	5	7032	5617	gi|153490	tetracycline C resistance and export protein [Streptomyces laevis]	44	21	1416
252	2	1331	1122	gi|1204989	hypothetical protein [GB:U00022.9] [Haemophilus influenzae]	44	30	210
263	2	3265	2093	gi|1136221	carboxypeptidase [Sulfolobus solfataricus]	44	26	1173
365	4	4963	3524	gi|1296822	orf1 gene product [Lactobacillus helveticus]	44	31	1440
543	3	1315	1833	gi|1063250	low homology to P20 protein of Bacillus licheniformis and bleomycin acetyltransferase of Streptomyces verticillius [Bacillus subtilis]	44	24	519
544	4	3942	4892	gi|1951460	PIM-C.1 gene product [Xenopus laevis]	44	32	951
792	1	1224	613	gi|205680	high molecular weight neurofilament [Rattus norvegicus]	44	28	612
48	18	11303	11911	gi|1511614	molybdopterin-guanine dinucleotide biosynthesis protein A [Methanococcus jannaschii]	43	27	609
59	8	3665	5128	gi|153490	tetracycline C resistance and export protein [Streptomyces laevis]	43	21	1464
59	10	5536	7527	gi|153022	lipase [Staphylococcus epidermidis]	43	22	1992
99	1	1346	681	gi|1419051	unknown [Mycobacterium tuberculosis]	43	21	666
310	8	9402	12134	gi|397526	clumping factor [Staphylococcus aureus]	43	21	2733
432	3	2782	2303	gi|A60540|A605	sporozoite surface protein 2 - Plasmodium yoelii (fragment)	43	29	480
519	3	2547	3122	sp|Q06530|DHSU_1.8.2.-1 (FC) (FCSO)	SULFIDE DEHYDROGENASE (FLAVOCYTOCHROME C) FLAVOPROTEIN CHAIN PRECURSOR (EC 1.8.2.-1) (FC) (FCSO)	43	23	576
4	13	12053	13321	gi|295671	selected as a weak suppressor of a mutant of the subunit AC40 of DNA dependent RNA polymerase I and III [Saccharomyces cerevisiae]	42	18	1269
94	2	1768	1091	gi|501027	ORF2 [Trypanosoma brucei]	42	31	678
127	4	5791	4550	gi|42023	ORF1 gene product [Escherichia coli]	42	21	1242
297	3	1515	1036	gi|142790	ORF1, putative [Bacillus firmus]	42	25	480
344	6	4097	3525	gi|40320	ORF 2 (AA 1-203) [Bacillus thuringiensis]	42	30	573
512	1	2167	1115	gi|405957	lyeef [Escherichia coli]	42	23	1053
631	1	2434	1223	gi|580920	rodD (gtaA) polypeptide (AA 1-673) [Bacillus subtilis] pir[S06048|S06048] probable rod protein [Bacillus subtilis sp|P13484|TAGE.BACSU PROBABLE POLY(GLYCEROL- PHOSPHATE) LPHN-GLUCOSYLTRANSFERASE (EC 2.4.1.52) (TECHOIC ACID BIOSYNTHESIS PROTEIN E)]	42	24	1212

TABLE 2

F. aureus - Putative coding regions of novel proteins similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)	match accession	match gene name	% sim	% Ident	length (nt)
685	3	2159	1739	gi|1303784	YqoD [Bacillus subtilis]	42	19	621
4132	1	787	395	gi|1022910	protein tyrosine phosphatase [Dictyostelium discoideum]	42	25	391
86	2	1375	884	gi|309506	spermidine/spermine N1-acetyltransferase [Mus saxicola] p1r[S43430][S43430]	41	30	492
191	12	14797	14075	gi|1124957	orf4 gene product [Methanobrevibacterium smithii]	41	22	723
212	6	2150	3127	gi|15873	observed 35.2kd protein [Mycobacteriophage 15]	41	26	978
213	3	1263	2000	gi|63692	Trsa [Yersinia enterocolitica]	41	18	738
408	4	2625	3386	gi|1197634	orf4, putative transporter; Method: conceptual translation supplied by author [Mycobacterium smegmatis]	41	24	762
542	1	3	1103	gi|457146	[rho] protein [Plasmodium yoelii]	41	21	1101
924	1	2	475	pir|JH0148|JH01	nucleolin - rat	41	30	474
1562	1	1	402	gi|552184	asparagine-rich antigen Pf35-2 [Plasmodium falciparum] p1r[S27826][S27826]	40	20	402
2395	1	518	261	pir|S42251|S422	hypothetical protein 5 - fowlpox virus	40	18	258
4077	1	3	305	gi|1055055	coded for by C. elegans cDNA YK37g1.5; coded for by C. elegans cDNA YK59.5; coded for by C. elegans cDNA YK19.5; alternatively spliced form or P32C9.8b [Caenorhabditis elegans]	39	21	303
948	1	1803	503	gi|1255425	C33C6.2 gene product [Caenorhabditis elegans]	37	25	501
59	12	8294	10636	gi|535260	STARP antigen [Plasmodium reichenowi]	36	24	2143
63	5	3550	8079	gi|298032	EF [Streptococcus suis]	36	19	4530
544	3	2507	3601	gi|1015903	ORF YJRI51c [Saccharomyces cerevisiae]	35	22	1095
63	4	1949	3574	gi|552195	circumsporozoite protein [Plasmodium falciparum] sp|P05691|CSP_PLAFL	32	27	1626

TABLE 2

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
4	1	1234	692
4	3	1712	2278
4	4	3703	3032
4	14	11073	12585
5	2	2539	1601
5	3	1532	1771
5	7	4741	4550
5	9	7939	6422
5	12	8711	8547
6	4	2359	1982
8	1	149	176
11	8	5144	5983
11	9	5968	6498
11	10	6472	6284
11	16	10956	11271
12	5	5352	4942
12	6	4596	4862
15	3	1895	1650
16	10	11263	10835
18	2	1093	917
20	9	9125	7764
20	10	8571	8230
20	12	9201	8803
20	13	12158	10470
23	1	674	339
23	6	6138	5485
23	8	6376	5942

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
23	9	7651	6881
23	15	12618	12830
24	4	4556	4185
24	6	5642	5241
25	2	1824	2402
31	2	505	849
31	3	1177	1524
31	4	2454	3005
32	2	765	1388
32	9	7952	8575
32	10	8591	8728
32	11	9738	9379
32	12	10797	10087
34	2	1315	1049
36	7	5226	5801
36	11	7575	7261
36	12	7424	7621
37	4	3158	2964
38	2	1585	980
38	11	6425	6868
38	20	16982	16371
38	26	20253	20804
38	27	20722	21266
39	1	1	627
40	1	805	404
43	1	796	428
44	4	2674	2324

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Optig	ORF	Start	Stop
Id	Id	(nt)	(nt)
44	5	2484	3263
44	14	10587	10129
44	20	13724	13536
44	21	13596	13994
45	7	6575	6297
46	8	6365	6520
46	12	10449	10976
46	17	15032	15424
47	1	288	1079
48	9	7620	7778
50	1	1612	962
50	2	1621	1316
51	1	738	370
51	5	2520	2245
53	1	442	287
53	7	6705	6319
54	7	9014	8709
55	1	592	326
55	3	1052	786
56	1	1	261
56	3	1551	1228
56	4	1970	1560
56	17	19092	18712
57	4	3694	3521
57	8	5436	5822
58	9	8885	8553
59	3	1366	1509

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig	ORF	Start	Stop
ID	ID	(nt)	(nt)
59	6	3036	2802
59	7	3770	3570
59	9	4946	4563
59	11	7518	8378
59	13	10401	116403
62	2	2696	1521
62	11	5440	5757
63	1	1	336
67	1	900	1781
67	2	1774	2610
67	3	2591	3904
67	8	7110	6955
68	1	78	326
70	6	6761	5199
70	11	8935	8645
77	3	1590	1192
79	2	1509	1228
79	3	1411	1791
83	1	2	403
85	9	8100	8653
85	10	8969	8781
86	3	1426	1232
87	8	9187	9166
88	3	1620	1922
89	1	3	161
89	7	5042	4878
91	1	1098	550

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
91	3	3938	3141
92	2	449	928
92	3	1958	1467
92	9	5638	6024
94	1	661	332
94	3	2445	1813
94	4	2583	2197
96	11	10601	11050
99	6	4672	4523
99	7	5014	4784
100	8	7658	7287
102	7	4697	4368
103	3	2496	2035
104	1	2	694
104	2	699	1277
105	1	1235	693
105	3	3213	2655
105	1	3	221
106	3	1209	1355
107	1	1081	542
109	4	4025	3651
109	13	11625	11196
109	14	11981	12268
109	20	17401	17688
110	1	2	760
114	10	8764	9384
116	1	1	309

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
116	3	6273	4862
116	8	11049	9976
116	9	10313	10158
120	5	3703	3320
120	6	4270	3869
120	11	9290	9844
121	2	417	569
126	3	1050	818
127	3	2648	3196
127	5	4084	4395
131	6	6773	6438
132	2	715	1695
134	1	2	667
135	2	512	258
135	3	1124	729
138	1	3	152
138	7	6008	6463
140	1	2080	1032
140	2	2019	1513
140	5	2387	2743
142	2	1360	2388
142	7	8830	7386
143	7	7290	6502
144	1	1227	640
146	1	2	513
146	3	502	1350
146	4	3673	2540

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
146	5	2874	3071
147	1	1	339
149	11	3956	3615
149	12	4036	3785
149	13	4507	4145
149	15	4807	4610
149	16	5495	5049
149	18	5739	5491
149	21	7416	7056
149	23	9216	8521
149	24	9681	9106
149	25	10679	9897
150	2	2303	1587
154	3	1795	1508
154	8	6586	6398
154	14	12704	12147
154	15	13531	12803
156	1	315	593
157	3	1183	2232
158	2	1471	1064
159	3	452	808
161	2	876	1808
161	6	4653	4279
161	7	4803	4540
161	8	4896	4717
161	11	5617	5638
163	2	1604	840

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
163	5	2796	2344
163	7	2952	2647
163	9	4905	5132
164	3	1338	1147
166	3	5213	4854
168	4	2500	2868
168	5	3595	4158
170	3	2517	2777
171	2	2277	1450
171	11	12576	11125
172	1	3	278
172	2	1940	1149
173	1	1289	708
173	5	7001	6114
174	2	593	1105
175	3	2552	2890
175	5	3820	3335
175	7	4342	4506
182	4	5477	4986
184	5	6043	5702
188	2	1210	1755
188	4	2647	2994
189	6	2614	3039
190	3	1998	2564
191	1	1	153
191	2	950	669
191	10	11786	13039

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
191	11	12902	12363
192	1	91	426
195	3	2106	1932
195	5	2899	2606
198	2	1016	1591
201	1	170	625
203	2	783	1466
206	6	8930	7815
206	12	11947	11636
206	21	28208	27960
212	2	170	817
212	3	796	1167
212	7	3128	3436
212	9	3749	4075
213	1	1	705
214	2	1076	570
214	6	4064	3738
214	9	6600	6995
214	10	7864	7469
217	1	1927	965
218	1	178	657
218	3	1776	2156
220	2	1851	1389
220	3	3251	2262
220	7	8275	7208
220	8	10244	8661
220	9	11796	10216

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
221	4	3095	2613
221	9	11428	10757
226	1	3	659
226	2	2196	1459
226	3	1476	1961
227	1	2	487
227	2	460	975
227	4	1855	2121
227	5	2052	2345
227	6	4760	3768
227	9	5591	6367
228	5	2503	2877
228	6	2846	3526
233	7	3944	3762
236	2	809	579
238	2	1975	1391
239	2	1417	905
241	5	4495	4334
242	2	1677	1363
243	1	127	576
244	1	1291	667
244	2	3035	1962
245	2	1614	1258
246	1	69	215
246	4	738	1733
249	3	3906	3712
250	1	494	249

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
254	1	1	156
256	2	956	1144
257	3	3700	3227
260	4	4906	4580
261	4	2196	2606
261	6	3214	3681
264	2	155	439
264	5	5252	4533
264	6	4739	5107
267	2	1323	931
268	4	5140	4700
272	1	862	446
272	3	1200	1439
272	9	4691	4909
272	10	6469	6035
276	4	1746	1901
278	1	224	553
278	5	3299	3448
278	7	4849	5127
285	2	551	736
288	3	1756	1950
288	5	2055	2276
289	1	2107	1055
290	2	2314	1932
291	2	332	622
291	5	1545	2051
295	3	1606	1349

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
295	4	2728	2141
295	5	2220	2762
297	2	788	465
298	1	2	205
300	2	2180	1928
301	7	2794	2624
304	1	3	194
306	1	109	654
306	5	4016	4257
307	1	674	339
307	8	3645	3995
308	1	1	654
308	2	1120	599
308	4	2643	2332
313	2	2314	1919
314	1	10	702
316	2	982	1381
316	6	2758	3165
317	1	2	1114
317	3	4570	3458
321	6	5645	5217
321	7	6319	6140
321	8	7450	6794
322	2	827	543
326	2	165	1112
326	3	1117	1467
328	1	936	469

TABLE 3

5. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig	ORF	Start	Stop
id	id	(nt)	(nt)
328	5	3452	3276
329	1	3	719
329	2	781	1212
329	3	1471	1833
330	1	576	289
330	3	1447	1623
332	3	2353	2204
332	7	4971	5138
333	2	3295	3128
335	1	864	433
337	2	95	526
340	2	1658	1356
341	1	3	281
341	3	2476	3192
341	5	3618	3544
341	6	3929	4558
344	5	3197	2889
345	1	1532	768
346	2	221	592
350	3	1410	1598
352	2	2178	1765
352	3	7316	4596
352	7	7967	8604
352	8	8906	9247
352	9	10171	9854
359	1	1	546
362	1	3	856

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
364	2	2158	1808
364	8	10974	10714
365	2	1612	1313
365	5	4680	4090
365	7	4980	6219
366	3	520	1719
367	3	906	1085
368	1	788	494
375	1	2	136
380	3	1351	1097
389	1	1	276
390	1	2	877
390	2	1373	1549
391	2	751	560
395	1	391	197
396	1	2132	1068
398	3	1344	1141
399	1	176	669
401	3	566	847
402	2	100	465
404	8	5561	5170
408	2	3507	2269
408	3	2875	2672
408	5	3524	4423
410	3	2111	1890
413	1	880	488
416	1	607	320

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
416	2	578	847
416	3	2195	1590
417	1	3	179
417	2	161	616
420	2	788	513
422	2	357	677
431	2	856	1407
432	2	446	1084
433	1	1	417
433	3	2311	2033
434	1	942	535
434	2	2089	1235
440	1	1	450
442	2	1269	3320
443	3	1873	1520
444	1	1	696
444	7	6761	6366
451	1	940	614
453	2	896	636
453	8	3833	4786
453	9	4718	4512
453	10	4937	4731
455	1	434	219
455	2	472	910
459	1	265	687
462	1	2	247
466	2	1494	907

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
467	1	654	349
468	1	2	250
469	1	1488	925
469	3	2386	3372
469	4	3464	3706
470	1	77	538
470	6	4098	3694
470	7	6330	5686
470	9	7351	8181
470	10	8175	9773
471	1	940	500
471	2	1562	1017
476	1	70	267
477	1	2	760
477	3	1764	2081
477	4	2066	2332
480	5	4016	4261
481	2	956	480
486	3	613	774
487	6	1795	2112
488	1	715	359
492	1	127	675
493	1	2	520
493	2	496	1242
502	3	1149	1571
504	1	690	346
505	5	4566	4150

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
511	2	1741	1232
512	2	583	747
515	1	609	812
517	4	2179	2511
520	4	2097	2360
520	6	3908	3669
527	1	1	498
528	1	637	335
529	2	1679	1104
530	7	5298	5534
536	1	308	156
538	1	1362	736
538	3	2203	2880
538	5	3531	3121
538	6	4348	3731
540	1	996	664
540	2	1495	1031
541	1	89	433
541	2	719	432
542	2	1048	1272
545	2	1012	734
551	1	2145	1129
555	2	892	704
558	3	1357	1154
558	4	1760	1458
558	5	2105	1821
558	6	2166	2020

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
558	7	2636	2322
558	8	3053	2802
558	9	3986	3453
560	1	475	921
565	3	1706	1485
571	1	308	156
571	3	994	1206
577	1	2	199
577	2	163	453
579	1	1	477
579	2	1784	1200
583	1	1988	996
585	1	946	539
587	1	22	573
588	2	1896	1372
588	3	1742	1554
590	1	47	334
592	2	1455	1141
593	1	2	775
593	2	817	1122
595	1	87	890
596	3	1593	1435
602	1	8	169
603	5	1071	1469
606	1	322	768
607	5	1444	1226
610	1	1029	541

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Cpntig ID	ORF ID	Start (nt)	Stop (nt)
612	1	3	500
616	1	991	650
617	2	736	491
622	1	36	347
625	4	2046	2349
627	1	67	210
628	1	901	452
631	3	4789	4004
634	1	1448	759
636	1	189	388
636	2	1929	1063
637	2	2323	1994
638	1	227	1081
639	1	518	261
639	2	1377	811
641	1	118	444
642	3	1615	1331
642	4	2260	1847
643	1	3	608
645	4	1514	1758
645	6	2035	2321
645	7	2940	2488
646	1	2	1045
660	1	77	601
660	2	576	872
661	1	1725	961
664	2	89	304

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
667	1	3	413
668	1	1	330
671	2	812	516
673	1	3	338
674	2	865	584
679	1	1	237
679	3	1589	1906
688	1	1236	835
688	2	1352	1077
694	1	3	143
696	2	818	432
706	1	364	224
709	3	1183	1449
711	1	3	908
715	1	3	167
716	1	2	637
721	1	133	570
722	1	763	383
723	1	1656	829
723	2	1498	1112
727	1	2	472
729	1	268	441
731	1	130	828
735	1	2	214
736	1	3	782
738	1	2	298
742	1	3	230

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
745	3	1148	780
748	2	282	464
749	1	685	344
751	1	901	452
755	1	97	522
755	2	520	918
758	2	663	400
764	2	1033	746
767	1	1	405
768	1	2	373
771	1	1058	534
778	1	1735	902
785	1	1790	1023
787	1	1260	631
791	1	3	224
799	1	15	260
804	1	304	711
805	1	3	680
808	1	219	842
810	1	2221	1112
810	2	1774	1442
812	1	38	979
817	1	714	358
818	2	487	1104
819	2	1529	1032
819	3	1748	1419
820	1	195	1064

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
828	1	506	255
829	1	48	800
830	1	578	291
832	1	594	298
835	1	310	796
840	3	491	709
845	1	912	457
850	2	303	449
853	1	715	359
860	1	2	256
864	1	18	410
864	2	383	715
864	6	1676	1828
870	1	1	588
873	1	906	454
875	1	584	294
877	1	1661	1020
878	1	981	544
879	1	1567	785
881	1	1	243
882	1	389	604
890	1	2	508
905	1	793	398
906	1	852	544
912	1	373	188
913	1	3	290
913	2	1092	547

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
915	1	6	161
915	2	169	402
921	1	126	386
927	1	1578	808
928	1	2	385
929	1	2	400
932	1	2	400
934	1	1	384
936	1	1052	528
937	1	2	616
945	1	220	645
945	2	649	1242
946	1	1702	950
949	1	1	270
951	1	3	362
955	1	3	143
960	1	723	400
963	1	1	162
965	1	690	346
966	1	1079	606
969	1	3	302
971	1	12	170
974	1	319	161
976	1	692	348
977	1	2	211
982	1	1926	982
984	1	589	296

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
987	1	3	467
993	1	1	325
994	1	920	549
1004	1	557	318
1014	1	624	313
1015	1	2	463
1016	1	288	145
1019	1	1205	660
1022	1	839	474
1024	1	595	299
1024	2	276	431
1030	1	673	338
1032	1	355	179
1040	1	794	399
1043	1	3	269
1044	2	115	399
1047	1	1	159
1051	1	704	354
1051	2	1233	733
1063	1	2	400
1069	1	2	148
1069	2	769	533
1075	1	707	399
1077	1	97	405
1081	1	58	438
1086	1	1	384
1087	2	246	431

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
1088	1	3	174
1096	1	474	238
1098	1	1015	509
1100	1	1020	511
1100	2	1520	1158
1101	1	703	353
1102	1	385	194
1107	1	2	580
1114	1	3	432
1115	1	2	268
1119	1	22	267
1129	1	40	342
1132	1	160	181
1133	1	609	376
1144	1	446	225
1147	1	558	280
1153	1	1	153
1154	1	3	818
1159	1	1	330
1161	1	341	186
1164	1	427	254
1171	1	19	240
1171	2	108	299
1183	1	2	379
1195	1	355	179
1196	1	1	189
1200	1	33	197

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
1203	2	129	464
1222	2	105	401
1232	1	1	387
1240	1	2	175
1247	1	520	311
1271	1	412	221
1286	1	2	595
1295	1	1	165
1306	1	367	185
1314	2	158	631
1316	1	58	570
1359	1	384	193
1370	1	1	402
1371	1	1	345
1374	1	710	357
1378	1	2	400
1392	1	3	413
1411	1	202	432
1433	1	331	167
1450	1	2	256
1453	1	295	149
1471	1	721	398
1477	1	869	639
1502	1	794	399
1518	1	126	449
1534	1	283	143
1546	1	3	401

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
1547	1	506	255
1583	1	3	350
1587	1	3	563
1602	2	170	679
1629	1	1	402
1665	1	468	235
1760	1	625	314
1762	1	3	200
1876	2	119	286
1895	1	2	379
1931	1	798	400
1976	2	715	383
2055	2	252	401
2056	1	331	167
2150	1	523	263
2157	1	794	399
2164	1	564	283
2175	1	218	400
2212	1	492	331
2338	1	732	367
2342	1	3	167
2352	1	330	166
2352	2	622	398
2355	1	47	352
2356	1	679	341
2359	1	301	152
2421	1	296	150

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig	ORF	Start	Stop
ID	ID	(nt)	(nt)
3046	1	367	185
3049	1	553	278
3050	1	3	314
3052	1	504	253
3065	1	2	157
3070	1	357	190
3075	1	440	222
3080	1	1	285
3092	1	320	162
3093	1	411	250
3100	1	52	237
3103	1	47	298
3118	1	344	174
3123	1	2	145
3127	1	1	147
3138	1	336	169
3142	1	388	203
3144	1	664	386
3151	1	337	170
3155	2	202	384
3168	1	12	176
3205	1	288	145
3282	1	1	150
3303	2	239	400
3371	2	211	399
3558	1	2	148
3558	2	16	401

TABLE 3

S. aureus - putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
	3046	1	367
	3049	1	553
	3050	1	3
	3052	1	504
	3065	1	2
	3070	1	357
	3075	1	440
	3080	1	1
	3092	1	320
	3093	1	411
	3100	1	52
	3103	1	47
	3118	1	344
	3123	1	2
	3127	1	1
	3138	1	336
	3142	1	388
	3144	1	664
	3151	1	337
	3155	2	202
	3168	1	12
	3205	1	286
	3282	1	1
	3303	2	239
	3371	2	211
	3558	1	2
	3558	2	36

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
3568	1	751	377
3595	1	757	380
3618	1	2	238
3618	2	130	402
3622	1	86	358
3622	2	664	398
3642	1	876	439
3649	1	781	398
3651	1	625	314
3664	1	467	637
3674	1	55	402
3677	1	619	311
3704	1	1	402
3726	1	535	269
3765	1	510	256
3779	1	554	357
3784	1	266	135
3784	2	667	377
3786	2	638	375
3801	1	474	262
3806	1	453	298
3807	1	42	389
3815	1	798	400
3827	1	3	320
3842	1	781	392
3853	1	671	399
3855	1	1	324

TABLE 3

S. aureus - putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
3857	1	2	235
3861	1	590	297
3865	1	695	399
3897	1	3	173
3897	2	143	400
3898	2	225	401
3921	2	103	342
3927	1	70	375
3930	1	76	234
3946	2	651	382
3951	2	105	377
3965	1	646	344
3973	1	795	400
3981	1	3	311
3998	1	3	356
4001	1	481	296
4003	1	90	335
4018	1	2	259
4018	2	186	401
4021	1	1	345
4043	1	3	344
4054	1	3	344
4066	1	1	150
4070	1	1	324
4072	2	187	350
4073	1	1	265
4077	2	127	372

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
4083	1	3	359
4090	1	27	368
4101	1	103	297
4105	1	1	306
4107	1	570	286
4119	1	629	339
4121	1	740	372
4123	1	3	230
4127	1	3	341
4128	1	2	331
4130	1	768	415
4146	1	97	381
4157	1	3	206
4186	1	505	254
4224	1	510	256
4239	1	1	348
4242	1	709	356
4252	1	589	296
4253	1	1	174
4256	1	568	323
4258	2	498	334
4267	1	284	144
4271	1	2	304
4287	1	303	163
4289	1	471	319
4302	1	153	305
4304	1	1	186

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
4304	2	96	314
4306	1	2	151
4318	1	576	289
4322	1	5	148
4331	1	439	221
4331	2	528	364
4338	1	728	399
4346	1	471	277
4367	2	117	311
4373	1	2	268
4381	1	574	326
4384	1	614	309
4397	1	9	311
4402	1	1	249
4403	1	606	328
4406	1	3	317
4411	1	2	280
4411	2	697	398
4412	1	2	364
4418	1	3	230
4424	1	601	398
4443	1	427	215
4471	1	643	323
4478	1	340	271
4482	1	50	289
4489	1	601	302
4491	1	12	206

TABLE 3

S. aureus - Putative coding regions of novel proteins not similar to known proteins

Contig ID	ORF ID	Start (nt)	Stop (nt)
4495	1	3	179
4496	1	500	252
4500	1	130	306
4511	1	493	248
4518	1	1	246
4526	1	480	241
4527	1	2	183
4532	1	3	239
4542	1	11	175
4567	1	36	200
4573	1	1	231
4578	1	642	322
4619	1	1	180
4620	1	349	176
4662	1	1	246
4669	1	2	157
4680	1	28	183
4690	1	344	174

Table 4

ORF	SEQ ID NO	BLAST HOMOLOG	Antigenic Regions			
			Region 1	Region 2	Region 3	Region 4
168_6	5192	lipoprotein	36-45	84-103	152-161	176-185
238_1	5193	chrA	21-39	48-58	84-95	232-249
51_2	5194	OppB gene product (B. sub	20-36	70-79	100-112	121-131
278_3	5195	lipoprotein 1	20-29	59-73	85-97	162-171
276_2	5196	lipoprotein	21-33	65-74	177-186	211-220
45_4	5197	ProX	28-37	59-69	85-100	120-129
315_8	5198	hypothetical protein	45-54	88-97	182-192	243-253
154_15	5199	unknown	31-40	48-58	79-88	95-104
228_3	5200	unknown	25-38	40-52	64-74	80-89
228_6	5201	unknown	29-41	89-101	128-143	173-184
50_1	5202	unknown	21-33	52-61	168-182	197-206
112_7	5203	iron-binding periplasmic	21-31	58-67	92-101	111-120
442_1	5204	unknown	30-39	91-100	122-137	182-192
66_2	5205	unknown	50-59	104-116	127-136	167-182
304_2	5206	Q-binding periplasmic	19-28	48-57	75-84	103-116
44_1	5207	hypothetical protein	27-36	86-95	129-138	192-201
161_4	5208	SphX	27-44	149-161	166-175	201-210
46_5	5209	cmpC (permease)	21-33	61-70	83-92	100-109
942_1	5210	traH [Plasmid pSK41]	83-92	109-118	127-142	
5_4	5211	ORF (S. aureus)	12-22	87-96	111-120	151-160
20_4	5212	peptidoglycan hydrolase (S.	24-34	129-138	141-150	161-171
328_2	5213	lipoprotein (H. flu)	81-90	123-133	290-299	
520_2	5214	fibronectin binding protein	44-54	63-79	81-90	95-110
771_1	5215	emm1 gene product (S. py	30-39	65-82	96-106	112-121
999_1	5216	predicted trithorax prot. (D	7-16	120-129	157-166	
853_1	5217	ORF2136 (Marchantia polyr	43-52	88-97	102-111	
287_1	5218	psaA homolog	13-22	28-44	72-82	114-124
288_2	5219	cell wall enzyme	14-23	89-98		
596_2	5220	penicillin binding protein 2b	40-49	59-68	76-87	106-115
217_5	5221	fibronectin/fibrinogen bindi	28-37	40-49	62-71	93-111
217_6	5222	fibronectin/fibrinogen bp	10-19	31-40	54-62	73-92
528_3	5223	myosin cross reactive prote	4-13	29-47	60-73	90-99
171_11	5224	EF	20-31	91-110		
63_4	5225	penicillin binding protein 2b	12-21	59-68	95-104	
353_2	5226		46-55	62-71		
743_1	5227	29 kDa protein in fimA regi	23-32	68-79	94-103	175-184
342_4	5228	Twitching motility	10-19	48-60	83-92	111-121
69_3	5229	arabinogalactan protein	97-106	132-141	158-167	180-189
70_6	5230	nodulin	36-45	48-57	137-160	179-188
129_2	5231	glycerol diester phosphodie	8-17	41-50	55-74	97-106
58_5	5232	PBP (S. aureus)	26-35	70-79	117-126	152-161
188_3	5233	MHC class II analog (S. aure	72-81	94-103	115-124	136-145
236_6	5234	histidine kinase domain (Dic	24-33	52-67	81-94	106-121
310_8	5235	clumping factor (S. aureus)	59-71	77-86	93-102	118-127
601_1	5236	novel antigen/ORF2 (S. aur	45-54	91-104	108-117	186-195
544_3	5237	ORF YJR151c (S. cerevisae	76-90	101-111	131-140	154-164
662_1	5238	MHC class II analog (S. aure	22-32	71-80	89-98	114-122
87_7	5239	5' nucleotidase precursor ('	29-45	62-71	105-114	125-137
120_1	5240	B65G gene product (B. sub	102-111			

EP 0 786 519 A2

Table 4

5	ORF	Antigenic		Regions		(cont)	
		Region 5	Region 6	Region 7	Region 8	Region 9	Region 10
	168_6	244-272	303-315				
	238_1	260-269	291-301	308-317			
	51_2	140-152	188-208	211-220	256-266	273-283	
10	278_3	198-209					
	276_2	255-268					
	45_4	177-199	221-230	234-243	268-279	284-293	304-313
	316_8						
	154_15	148-157	177-187	202-211			
15	228_3	101-119	139-154	166-181			
	228_6						
	50_1						
	112_7	136-149	197-211	218-229	253-273		
	442_1	199-210	247-257	264-277	287-309		
20	66_2						
	304_2	178-187	250-259				
	44_1						
	161_4						
	46_5	131-141	162-176	206-215	243-252	264-273	285-294
25	942_1						
	5_4	189-205	230-239	246-264	301-318	340-354	378-387
	20_4	202-212	217-234	260-275	314-336	366-373	380-391
	328_2						
	520_2						
30	771_1	145-154					
	999_1						
	853_1						
	287_1	154-164					
	288_2						
35	596_2	121-130					
	217_5	244-253	259-268	288-297	302-311		
	217_6	144-158	174-183	188-197	207-216	226-242	
	528_3						
40	171_11						
	63_4						
	353_2						
	743_1	197-207					
	342_4						
	69_3	195-211					
45	70_6	206-215	263-272	291-301	331-340	358-371	390-414
	129_2	117-127	141-157	168-183	202-211	222-231	261-270
	58_5	184-203	260-269	275-299	330-344	372-381	424-433
	188_3						
	236_6	138-147	163-172	187-198	244-261	268-278	308-317
50	310_8	131-140	144-153	177-186	190-199	204-213	216-227
	601_1	208-218					
	544_3	170-179	184-193	224-235	274-287	327-336	352-361
	662_1						
55	87_7						
	120_1						

Table 4

ORF	Antigenic		Regions		(cont)	
	Region 11	Region 12	Region 13	Region 14	Region 15	Region 16
168_6						
238_1						
51_2						
278_3						
276_2						
45_4						
316_8						
154_15						
228_3						
228_6						
50_1						
112_7						
442_1						
66_2						
304_2						
44_1						
161_4						
46_5	306-315					
942_1						
5_4	393-407	416-426	456-465			
20_4	396-405	410-419	461-481			
328_2						
520_2						
771_1						
999_1						
853_1						
287_1						
288_2						
596_2						
217_5						
217_6						
528_3						
171_11						
63_4						
353_2						
743_1						
342_4						
69_3						
70_6	453-471	506-515				
129_2	296-315					
58_5						
188_3						
236_6	358-377	410-423	428-439	442-457	467-476	480-493
310_8	238-251	256-275	281-290	296-310	314-333	338-347
601_1						
544_3						
662_1						
87_7						
120_1						

EP 0 786 519 A2

Table 4

5	ORF	Antigenic		Regions (cont)		Region 21	Region 22
		Region 17	Region 18	Region 19	Region 20		
	168_6						
	238_1						
	51_2						
10	278_3						
	276_2						
	45_4						
	316_8						
	154_15						
15	228_3						
	228_6						
	50_1						
	112_7						
	442_1						
20	66_2						
	304_2						
	44_1						
	161_4						
	46_5						
25	942_1						
	5_4						
	20_4						
	328_2						
	520_2						
30	771_1						
	999_1						
	853_1						
	287_1						
	288_2						
35	596_2						
	217_5						
	217_6						
	528_3						
	171_11						
40	63_4						
	353_2						
	743_1						
	342_4						
	69_3						
45	70_6						
	129_2						
	58_5						
	188_3						
	236_6						
50	310_8	357-366	370-379	429-438	443-452	478-487	551-560
	601_1						
	544_3						
	662_1						
55	87_7						
	120_1						

Table 4

	ORF	Antigenic Regions (cont)					
		Region 23	Region 24	Region 25	Region 26	Region 27	Region 28
5	168_6						
	238_1						
	51_2						
10	278_3						
	276_2						
	45_4						
	316_8						
	154_15						
15	228_3						
	228_6						
	50_1						
	112_7						
	442_1						
20	66_2						
	304_2						
	44_1						
	161_4						
	46_5						
25	942_1						
	5_1						
	20_4						
	328_2						
	520_2						
30	771_1						
	999_1						
	853_1						
	287_1						
	288_2						
35	596_2						
	217_5						
	217_6						
	528_3						
	171_11						
40	63_4						
	353_2						
	743_1						
	342_4						
	69_3						
45	70_6						
	129_2						
	58_5						
	188_3						
	236_6						
50	310_8	622-632	670-685	708-718	823-836	858-867	877-886
	601_1						
	544_3						
	662_1						
	87_7						
55	120_1						

Table 4

	ORF	Antigenic Regions		(cont)
		Region 29	Region 30	
5	168_6			
	238_1			
	51_2			
10	278_3			
	276_2			
	45_4			
	316_8			
	154_15			
15	228_3			
	228_6			
	50_1			
	112_7			
	442_1			
20	66_2			
	304_2			
	44_1			
	161_4			
	46_5			
25	942_1			
	5_4			
	20_4			
	328_2			
	520_2			
30	771_1			
	999_1			
	853_1			
	287_1			
	288_2			
35	596_2			
	217_5			
	217_6			
	528_3			
	171_11			
40	63_4			
	353_2			
	743_1			
	342_4			
	69_3			
45	70_6			
	129_2			
	58_5			
	188_3			
50	236_6			
	310_8			
	601_1			
	544_3			
	662_1			
55	87_7			
	120_1			

Table 4

ORF	BLAST		Antigenic Regions			
	HOMOLOG		Region 1	Region 2	Region 3	Region 4
46_1	5241	aldehyde dehydrogenase	8-17	36-52	83-96	112-121
63_4	5242	glycerol ester hydrolase (P.	9-26	57-73	93-107	123-133
174_6	5243	ketopantoate hydroxymeth	71-80	203-212	242-254	265-274
206_16	5244	ornithine acetyltransferase	1-10	34-43	54-63	194-210
267_1	5245	NaH-antiporter protein (E. f	120-129	332-347	398-408	
322_1	5246	acriflavin resistance protein	58-75	153-164	203-231	264-284
415_2	5247	transport ATP-binding prot	108-126	218-227	298-308	315-334
214_3	5248	2-nitropropane dioxygenase	123-136	216-233	283-292	297-306
587_3	5249	clumping factor	5-14	43-54	59-68	76-95
685_1	5250	signal peptidase	59-68	72-81	86-95	99-108
54_3	5251	fibronectin binding protein I	23-32	37-46	50-59	89-98
54_4	5252	fibronectin binding protein I	43-52	66-75	95-104	147-156
54_5	5253	fibronectin binding protein I	49-60	81-90		
54_6	5254	fibronectin binding protein I	55-71	82-97	139-158	175-186
328_1	5255	lipoprotein (H. flu)	11-20	61-70	96-105	

Table 4

ORF	Antigenic Regions (cont)					
	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10
46_1	215-242	333-352	376-385	416-432	471-487	
63_4	145-154	191-202	212-223	245-265	274-283	291-300
174_6						
206_16	239-259	275-284				
267_1						
322_1	298-319	350-359				
415_2	344-353	371-380	395-404	456-465	486-495	518-527
214_3	318-337	365-375				
587_3	106-115	142-151	156-166	173-182	186-198	204-213
685_1	113-122	130-145				
54_3	128-138	185-194	217-226	251-260	268-277	295-305
54_4	175-188	191-200	203-212	220-229		
54_5						
54_6	220-230	287-304	317-326	344-353	364-373	378-387
328_1						

Table 4

ORF	Antigenic Regions			(cont)		
	Region 11	Region 12	Region 13	Region 14	Region 15	Region 17
46_1						
63_4	306-315	319-328	366-376	395-420	453-462	467-476
174_6						
206_16						
267_1						
322_1						
415_2	539-555					
214_3						
587_3	217-226	278-287	318-327	332-342	351-360	377-386
685_1						
54_3	316-325	329-345	355-372	387-396	416-425	438-448
54_4						
54_5						
54_6	396-407	427-436	514-531	541-550	569-578	612-622
328_1						

Table 4

ORF	Antigenic Regions			(cont)		
	Region 18	Region 19	Region 20	Region 21	Region 22	Region 23
46_1						
63_4	485-500	513-525				
174_6						
206_16						
267_1						
322_1						
415_2						
214_3						
587_3	396-405	426-442	459-470	485-494	505-514	531-562
685_1						
54_3	455-462	472-491	517-536			
54_4						
54_5						
54_6	639-648	673-681	703-715	723-732	749-760	772-788
328_1						

Table 4

ORF	Antigenic Regions (cont)					
	Region 24	Region 25	Region 26	Region 27	Region 28	Region 29
46_1						
63_4						
174_6						
206_16						
267_1						
322_1						
415_2						
214_3						
587_3	567-578	584-601	607-840	844-854	858-870	877-886
685_1						
54_3						
54_4						
54_5						
54_6	793-802	811-826	834-848	866-876	893-903	907-918
328_1						

Table 4

ORF	Antigenic Regions (cont)	
	Region 30	Region 31
46_1		
63_4		
174_6		
206_16		
267_1		
322_1		
415_2		
214_3		
587_3	889-911	927-936
685_1		
54_3		
54_4		
54_5		
54_6	925-944	951-997
328_1		

SEQUENCE LISTING

5 (1) GENERAL INFORMATION:

(i) APPLICANT:

- 10 (A) NAME: Human Genome Sciences, Inc.
(B) STREET: 9410 Key West Avenue
(C) CITY: Rockville
(D) STATE: Maryland
15 (E) COUNTRY: US
(F) POSTAL CODE: 20850

(ii) TITLE OF INVENTION: Staphylococcus aureus Poly-
nucleotides and Sequences

20 (iii) NUMBER OF SEQUENCES: 5255

(v) COMPUTER READABLE FORM:

- 25 (A) MEDIUM TYPE: Diskette, 3.50 inch, 1.4 Mb storage
(B) COMPUTER: HP Vectra 486/33
(C) OPERATING SYSTEM: MSDOS version 6.2
30 (D) SOFTWARE: ASCII Text

(vi) CURRENT APPLICATION DATA:

- (A) APPLICATION NUMBER:
35 (B) FILING DATE:

(vii) PRIOR APPLICATION DATA:

- 40 (A) APPLICATION NUMBER: US 60/009,861
(B) FILING DATE: 05-JAN-1996

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 5895 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

10 TCCATTATGA AGTCACAAGT ACTATAAGCT GCGATGTTAC CAATGTTTTT TAAAATCCCA 60
 GTAATAAAAT CAAAAAATAA GTTAAATAAT GTATTCATTT TAAGTCCTCC TTAATAAAGa 120
 15 aaataGGTAA TAATGTAATA GCTTCTATTA TGATGCCTAA TTGAATGAAT TGGGCAAATG 180
 GCTCTTTGAT GATAAGTGTG ATAATGAAAA GGGTTAAACT AACATAATC GCATAATATT 240
 TTTTTCGTTT AATAAGTCGC ACAGGAATGG GCTTCTTTTT AGTTGCTGCA GGAGCATATA 300
 20 CTGAGATTAC ACCTAAAGAA ATAAGTGTAA AAATAATCAT AATTAAAAAG TTAATATGAA 360
 AATTTACTAT TACTAAAGGT AAAAGTATAA ATAGTATAAT ACTTTCTACA TAACACCAAA 420
 AAGAAGAAGG TGCATGTGCa CCATGTGCAT GtCTTCTTAT TAAATAAAAT GTTAAATTCC 480
 25 TAATTAACGT AAACAGAAAA ATGTTTAAAA TATAGGCAAT AGTATACATA ACAATTAATT 540
 TACCTATATT TTTAGCTAAG ACCTGCATCC CTAATCGTAC TTGCAAAAAT TGAATATGAT 600
 30 CTAAGTTATT TCTCTTTTGA AGATACGTGG CAAACTGGTC AATTTTATTA TCAAAATAAT 660
 TCAATTTTAC ACCACTCTCC TCACTGTCAT TATACGATTT AGTACAATCT TTTATCATT 720
 TATTGCCTAA CTGTAGGAAA TAAATACTTA ACTGTTAAAT GTAATTTGTA TTTAATATTT 780
 35 TAACATAAAA AAATTTACAG TTAAGAATAA AAAACGACTA GTTAAGAAAA ATTGGAAAAT 840
 AAATGCTTTT AGCATGTTTT AATATAACTA GATCACAGAG ATGTGATGGA AAATAGTTGA 900
 TGAGFTGTTT AATTTTAAGA ATTTTATCT TAATTAAGGA AGGAGTGATT TCAATGGCAC 960
 40 AAGATATCAT TTCAACAATC GGTGACTTAG TAAATGGAT TATCGACACA GTGAACAAAT 1020
 TCACTAAAAA ATAAGATGAA TAATTAATTA CTTTCATTGT AAATTTGTGA TCTTCGTATA 1080
 45 GTACTAAAAG TATGAGTTAT TAAGCCATCC CAACTTAATA ACCATGTAAA ATTAGCAAGT 1140
 GAGTAACATT TGCTAGTAGA GTTAGTTTCC TTGGACTCAG TGCTATGTAT TTTTCTTAAT 1200
 TATCATTACA GATAATTATT TCTAGCATGT AAGCTATCGT AAACAACATC GATTTATCAT 1260
 50 TATTTGATAA ATAAAATTTT TTTCATAATT AATAACATCC CCAAAAATAG ATTGAAAAAA 1320
 TAACTGTAAA ACATTCCCTT AATAATAAGT ATGGTCGTGA GCCCCTCCCA AGCTCGCGGC 1380
 CTTTTTTGTA ATGAAGAAGG GATGAGTTAA TCATCATTAT GAGACCCGCC GTTAAATAT 1440

EP 0 786 519 A2

	TCATTTGCAA	AGGGCGAAAT	GGGTTCTTAC	TGAGTTATCT	ATTATAAAAA	AATAAACATA	1560
	GACTTATGAA	AAATCTCTCA	TAAATCTATG	TTTAGTCATG	aCATGTGTTA	AATATTATTT	1620
5	CGGGCGCTTC	TTATTTATAC	AAATCTAATT	TAATACTTTT	AAATACAGGT	ATATTTTCgC	1680
	GTTGCTGTTC	TACTTCATTT	AAGTTTAAAT	CTACAGTCAA	AATATCTGCG	GATTCATTTA	1740
10	ATTCTCCAAC	TAAATCTCCA	TTTGGGTTTA	TAACATCGA	ATGACCAGCA	TATTCTGTGT	1800
	TACCATCGAA	TCCAGTGCTA	TTAGTTCCAA	TGACAAACAT	ATTATTTTCA	ATTGCACGTG	1860
	CCTTTAGTAA	TGAATGCCAA	TGTTGAAGAC	GTGACATAGG	CCATTGCGCC	ACATAAAATG	1920
15	CAATTTTAGC	ACCACTACGA	GCAGGATATC	TTAATAATTC	TGGAAAACGT	AAATCATAAC	1980
	AGATAAGTTG	GGTCACATAA	GTACCGTCAG	ACAATTGAAA	GGGTTCAGCT	ACGTATTCCG	2040
	CAGCGGTTAA	AAATTCATGC	TCTCTTAACA	TAGGAACTAA	ATGAACTTTG	TCGTATTCaT	2100
20	TAATCAGCTG	GCCACTTTTA	TTCACACTAA	AAGCTGTATT	AAATATTTGA	TGTTTTCTAA	2160
	TGTTAGAAAC	TGACCCAGCT	ACGATATCGA	CTTTATATTT	TTCAGCTAAA	TGTTTAATAA	2220
	ATGAAAAACT	TTGTCCTAGA	TTATTATCTG	CTTTTTTCA	TAAATGCTCT	AAATCATAGC	2280
25	CATTATTCCA	CATTTTCAGT	AAAACGACTA	CATCTACTTC	AGCATTTCATA	TTTTTTTCGA	2340
	ACCATTGCGT	TATTTGAGTT	TCATTTTTAG	AACTATCTCC	AAAAACAATC	GGTAATTGAT	2400
30	AAATTTGGAC	TTTCATAACA	TCACATCCTT	GATAGATCTT	ATATATAACT	TACTAAAAGT	2460
	TATGTTGAAA	CGCAAAAAAC	GAGCACAAGA	CATAAAATCA	AAGTCCTAGG	CTCTACAAAG	2520
	TTATATTGAC	AGTAGTTGAT	GGGGCCCCAA	CATAGAGAAA	TTGGAACACC	AATTTCTACA	2580
35	GACAATGCAA	GTTGGGGTGG	GCTCTAACAT	AAAGAAATAC	TTTTTCTTTA	GAAATTAGTA	2640
	TTTCTTATAC	ATGAGTTTTA	CTCATGTATT	CCTATTCTTA	AGTGCACATT	AGCAGCGGCT	2700
	AATGTGTAAG	AACTACTACA	TAATGAATAA	CTAATGATTC	TTTATCATTT	CTGTCCCATT	2760
40	CCTAACAAATA	TATTGATTAT	TTTTTTATTA	CGAAACGATC	TTCCACTGGA	TTAAATGTTT	2820
	TTTCGCCAGC	AGCTTCACGA	ATATCACCAA	ATGGCATTTC	AGCAATAAGT	TTCCAACTTT	2880
45	TAGGAATATT	AAATTCATTT	GAAGTCATCT	CATCAACAAG	TGGATTATAG	TGTTGTAATG	2940
	AAGCACCTAT	GCCTTTAGTA	GCTAATGCAG	TCCAAATTGC	AAATTGATGC	ATGGCATTTC	3000
	TTTGAGTTGA	CCATATTGCA	AAATTATCAT	AGTAGTTTGG	CATTTGTTCT	TGTAAACCAC	3060
50	TTACAACATC	TTGATCTTCA	TAAAACAAAA	TTGTACCGTA	TGAATGTTTG	AAGTTATCAA	3120
	TTTTTTGTTC	AGTTGGCTCG	AAATCACGAT	TCTCTCCCAT	GACTTCTTTT	AAAATTGCTT	3180
55	TTGTGTTATC	CCAAAATTTA	TTATTGTTGT	CATTTAACAA	GAGAACAATT	CTAGTTGATT	3240

	CATCGCTAAT	TGATATCGAA	TCTTTCAAAT	TATATATTGA	ACGTCTTTCT	TCCATTGCAT	3360
	TGTCAAAAGT	CATTGCTTTT	TTATCTTTTT	TAAATAAGCC	CATAATTATT	GTCCTTCTT	3420
5	TAGTAAAGAA	TACTTAATAG	ACTAAGTATA	AAATTTATAC	TCGTACTTGT	AAAGCAATAT	3480
	TTACGAAAAT	TTCAAGAATA	TTAATATTCA	TTTTCAAATT	CCAAATATAA	ATGCATTTTC	3540
	AACGCATATT	TATTATACTT	AGATTAATAC	TTACATGAAA	AAGGGAGGTG	TCTCGTGAAA	3600
10	TGTCATATCA	TTGGTTTAAG	AAAATGTTAC	TTTCAACAAG	TATTTTAATT	TTAAGTAGTA	3660
	GTAGTTTAGG	GCTTGCAACG	CACACAGTTG	AAGCAAAGGA	TAACTTAAAT	GGAGAAAAAC	3720
15	CAACTACTAA	TTTGAATCAT	AATATAACTT	CACCATCAGT	AAATAGTGAA	ATGAATAATA	3780
	ATGAGACTGG	GACACCTCAC	GAATCAAATC	AAACGGGTAA	TGAAGGAACA	GGTTCGAATA	3840
	GTCGTGATGC	TAATCCTGAT	TCGAATAATG	TGAAGCCAGA	CTCAAACAAC	CAAAACCCAA	3900
20	GTACAGATTC	AAAACCAGAC	CCAAATAACC	AAAACCTCAAG	TCCGAATCCT	AAACCAGATC	3960
	CAGATAACCC	GAAACCAAAA	CCGGATCCAA	AACCAGACCC	AGATAAACCA	AAGCCAAATC	4020
	CGGATCCAAA	ACCAGATCCA	GATAACCCGA	AACCAAATCC	AGATCCAAAA	CCAGACCCAG	4080
25	ATAAACCAAA	GCCAAATCCG	GATCCAAAAC	CAGATCCAGA	TAAACCAAAG	CCAAATCCGA	4140
	ATCCAAAACC	AGACCCTAAT	AAGCCAAATC	CTAACCCGTC	ACCAGATCCC	GATCAACCTG	4200
30	GGGATTCCAA	TCATTCTGGT	GGCTCGAAAA	ATGGGGGGAC	ATGGAACCCA	AATGCTTCAG	4260
	ATGGATCTAA	TCAAGGTCAA	TGGCAACCAA	ATGGGAATCA	AGGAAACTCA	CAAAATCCTA	4320
	CTGGTAATGA	TTTTGTATCC	CAACGATTTT	TAGCCTTGGC	AAATGGGGCT	TACAAGTATA	4380
35	ATCCGTATAT	TTTAAATCAA	ATTAATAAGT	TGGGCAAAGA	TTATGGAGAA	GTTACTGATG	4440
	AAGACATTTA	TAATATTATT	CGAAAACAAa	ATTTTCAGCG	AAATGCATAT	TTAAATGGAT	4500
	TACAACAGCA	ATCGAATTAC	TTTAGATTCC	aATATTTCAA	TCCATTGAAA	TCAGAAAGGT	4560
40	ACTATCGTAA	TTTAGATGAA	CAAGTACTCG	CATTAATTAC	TGGTGAAATT	GGATCAATGC	4620
	CAGATTTGAA	AAAGCCCGAA	GATAAGCCGG	ATTCAAAACA	ACGCTCATTT	GAACCGCATG	4680
45	AAAAAGACGA	TTTTACAGTA	GTTAAAAAAC	AAGAAGATAA	TAAGAAAAGT	GCGTCAACTG	4740
	CATATAGTAA	AAGTTGGCTA	GCAATTGTAT	GTTCTATGAT	GGTGGTATTT	TCAATCATGC	4800
	TATTCTTATT	TGTAAAGCGA	AATAAAAAGA	AAAATAAAAA	CGAATCACAG	CGACGATAAT	4860
50	CCGTGTGTGA	TTCGTTTTTT	TTATTATGGA	ATAAAAATGT	GATATATAAA	ATTCGCTTGT	4920
	TCCGTGGCTT	TTTTCAAAGC	CTCAGGATTA	AGTAATTGGA	ATATAACGAC	AAATCCGTTT	4980
55	TGTAACATAT	GGATAATAAT	TGGAACAGCA	AGCCGTTTTG	TCCAAACATA	TGCTAATGAA	5040

AATATTAATG AACTTACTGT TGTAGCAATA ATAAATGCCA CGATACGATT ACCTTTAATC 5160
 GCATTAAATA ATTCTCCAAA GATTACTTTT CTGAATACAT ATTCTTCTAA TAAAGGACCA 5220
 5 ATAATAGATA CAAAGAAGAT AAATATAGGT ATTTTTCGAG CAATAATAAT TAGCTTTTCT 5280
 GTATTAGGAC TTA CTGTGTTG TCCACCATAA ATTTGCGTTA ATACAATGCT CACTACCATT 5340
 10 TGATAAATCA TTACCAATGC AAATCCAAGC AATGCCCATG GAATGATATA TTTT TAGGT 5400
 TCTTTAACTT CTAATTCTAA TTTTGTGGA TTTTAAATTT TTAAATTAAT TAAAATAATC 5460
 GTCGTGGCGG CGATTAAAAA TAGAACAAGT TGTATGTAAA TGA CTGCTT AGTCAGTTCT 5520
 15 ATGCCACTAT ATTGTACAAA TGGTAATTTT TTTACAATGA GAAGCGGTAA AAATTGAGAC 5580
 AATATATAAA TAATAACAGT TAGCAATGAT GCCCATAATC tTGT CATAAT TTTCTCCAA 5640
 ATATTTGTTT ATAATTTATT TTATCGTAAA TAACTGAAG TTACAAACT TAATTAAAAG 5700
 20 GTTATGACTT GAAATTTTGA CCAATTTGA TTATTATAAA TGTATGTTAG CACTCTTTAA 5760
 TGTTAAGTGC TAACTTTAG GTTTTAAAG GAGGAACAAT CATGCTAAAA CCAATTGGAA 5820
 ATCGTGTGAT TATTGAGAAA AAAGAACAAG AACAAACAAC TAAAAGTGn ATTGTTTAAC 5880
 25 TGATAGTGCT AAAGA 5895

(2) INFORMATION FOR SEQ ID NO: 2:

- 30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6796 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

TTTGAAAAAA CAAGGTACGA TTGGTTTAAT AACATATATG AGAACCGATT CTACACGTAT 60
 40 TTCaGATACT GCCAAAGTTG AAGCAAAACA GTATATAACT GATAAATACG GTGAATCTTA 120
 CACTTCTAAA CGTAAAGCAT CAGGGAAACA AGGTGACCaa GATGCCCATG AGGCTATTAG 180
 45 ACCTTCAAGT ACTATGCGTA CGCCAGATGA TATGAAGTCA TTTT TGACGA AAGACCAATA 240
 CCGATTATAC AAATTAATTT GGGAACGATT TGTTGCTAGT CAAATGGCTC CAGCAATACT 300
 TGATACAGTC TCATTAGACA TAACACAAGG TGACATTAAA TTTAGAGCGA ATGGTCAAAC 360
 50 AATCAAGTTT AAAGGATTTA TGACACTTTA TGTAGAACT AAAGATGATA GTGATAGCGA 420
 AAAGGAAAAT AAAGTGCCTA AATTAGAGCA AGGTGATAAA GTCACAGCAA CTCAAATTGA 480
 ACCAGCTCAA CACTATACAC AACCACCTCC AAGATATACT GAGGCGAGAT TAGTAAAAAC 540

55

	AAAGCGTAAC TATGTCAAAT TAGAAAGTAA GCGTTTTGTT CCTACTGAGT TGGGAGAAAT	660
5	AGTTCATGAA CAAGTGAAAG AATACTTCCC AGAGATTATT GATGTGGAAT TCACAGTGAA	720
	TATGGAAACG TTACTTGATA AGATTGCAGA AGGCGACATT ACATGGAGGA AAGTAATCGA	780
	CGGTTTCTTT AGTAGCTTTA AACAAAGATGT TGAACGTGCT GAAGAAGAGA TGGAAAAGAT	840
10	TGAAATCAAA GATGAGCCAG CCGGTGAAGA CTGTGAAATT TGTGGTTCTC CTATGGTTAT	900
	AAAAATGGGA CGCTATGGTA AGTTCATGGC TTGCTCAAAC TTCCCGGATT GTCGTAATAC	960
	AAAAGCGATA GTTAAGTCTA TTGGTGTTAA ATGTCCAAAA TGTAATGaTG GTGACGTCGT	1020
15	AGAAAGAAAA TCTAAAAAGA ATCGTGTCTT TTATGGATGT TCGAAATATC CTGAATGCGA	1080
	CTTTATCTCT TGGGATAAGC CGATTGGAAG AGATTGTCCA AAATGTAACC AATATCTTGT	1140
	TGAAAATAAA AAAGGCAAGA CAACACAAGT AATATGTTCA AATTGCGATT ATAAAGAGGC	1200
20	AGCGCAGAAA TAATATTTTT ATTTCTAGA TACATTTTAA GATTGTTAAA TAGAATCATT	1260
	AGTGAATCTT ATTTTAAAGA TAGTAAAGGA TTAATCTAAA TAAGTGCGGA TAATATAAAC	1320
25	ATAACAACAT AATTAAmAGA CATAAATGAC aATAAAAGGA GTATAGAAAT GACTCAAAC	1380
	GTAAATGTAA TAGGTGCTGG TCTTGCCGGT TCAGAAGCGG CATATCAATT AGCTGAAAGA	1440
	GGAATTAAAG TTAATCTAAT AGAGATGAGA CCTGTTAAC AAACACCAGC GCACCATACT	1500
30	GATAAATTTG CGGAACTTGT ATGTTCCAAT TCATTACGCG GAAATGCTTT AACTAATGGT	1560
	GTGGGTGTTT TAAAAGAAGA AATGAGAAGA TTGAATTCTA TAATTATTGA AGCGGCTGAT	1620
	AAGGCACGAG TTCCAGCTGG TGGTGCATTA GCAGTTGATA GACACGATTT TTCAGGTTAT	1680
35	ATTACTGAAA CACTTAAAAA TCATGAAAAT ATCACAGTTA TTAATGAAGA AATTAATGCC	1740
	ATTCCAGATG GATACACAAT TATCGCAACA GGACCACTTA CTACAGAAAC CCTTGCGCAA	1800
	GAAATAGTGG ACATTACTGG TAAAGATCAA CTTTATTTCT ATGATGCGGC TGCTCCAATT	1860
40	ATTGAAAAAG AATCTATTGA TATGGATAAA GTTTACTTAA AGTCCCGTTA TGATAAAGGT	1920
	GAAGCTGCAT ATTTAAACTG TCCTATGACT GAGGATGAAT TTAATCGCTT TTATGATGCA	1980
45	GTATTAGAAG CTGAAGTTGC GCCTGTAAAT TCATTTGAAA AAGAAAAATA TTTCGAGGGT	2040
	TGTATGCCTT TTGAAGTAAT GGCAGAACGC GGACGCAAGA CATTACTATT TGGACCAATG	2100
	AAACCAGTAG GATTAGAAGA TCCAAAGACT GGGAAACGTC CTTATGCGGT GGTTCaATTA	2160
50	AGACAAGATG ACGCTGCTGG TACACTCTAC AATATTGTTG GCTTCCAAAC GCATTTAAAA	2220
	TGGGGAGCTC AAAAAGAAGT CATTAAATTA ATTCCAGGCT TAGAAAATGT TGATATTGTT	2280
55	AGATATGGTG TGATGCATAG AAATACCTTC ATTAATTCAC CGGACGTATT AAACGAGAAA	2340

EP 0 786 519 A2

	TATGTAGAAA GCGCagcTAG CGGCTTAGTT GCAGGTATCA ATCTTGCGCA TAAAAATATTA	2460
	GGCAAGGGTG AGGTAGTATT TCCGAGAGAA ACAATGATTG GAAGTATGGC TTACTATATT	2520
5	TCTCATGCTA AAAACAATAA GAATTTCCAA CCTATGAATG CTAACCTCGG GTTATTACCA	2580
	TCTTTAGAAA CTAGAATTAA AGATAAAAAA GAACGCTATG AAGCACAAGC TAATAGAGCT	2640
10	TTGGATTACT TAGAAAATTT CAAAAAACT TTATAAAATA GTTAGAAAGA CTAGATATGC	2700
	TATTCATTCT TAAGTCATCA ACGAGTAAGT AATGACTTTC TAAATGGAAA ATACTTATCC	2760
	TAGTCTTTTT AATTTTGGAA TTGTTACGTA TTTCTGACAA TTTAGAATTC GCATTCAAAA	2820
15	AATATCTAAA TAAATAACAC GCAATAAGTT GATTGATGTA ACATGTAAGA GAATGTTTTA	2880
	AATAAACTTT ATTTAAAAGG CAATGAAATA ATAAATGGCA AGGCTATTAA TAAAGACTTT	2940
	TAGTAATTAA TTTAAAAAAG AGGTATTCTA ATTAACAGGT TTTCCGATTA GTTACAATTA	3000
20	TTTAATTCTC AAAAGATTTA GAATTGATTA TCAAATTACT GTAAGCCCTT TGCTGTATAT	3060
	GCTACAATTC TTATTGATGG AGGGTAAATG TATTGAATCA TATTCAAGAT GCGTTTTTAA	3120
25	ATACATTGAA AGTTGAACGG AATTTTTCGG AACACACATT GAAATCATAT CAAGATGACT	3180
	TAATTCAGTT TAATCAATTT TTAGAACAAG AACATTTAGA GTTGAATACT TTTGAATACA	3240
	GAGATGCTAG AAATTATTTG AGCTATTTAT ATTCAAATCA TTTGAAAAGA ACATCTGTTT	3300
30	CTCGTAAAAT CTCAACGTTA AGAACTTTCT ATGAATATTG GATGACGCTT GATGAGAACA	3360
	TTATTAATCC ATTTGTTCAA TTAGTACATC CGAAAAAGA AAAATATCTT CCGCAATTCT	3420
	TTTACGAAGA AGAAATGGAA GCGTTATTCA AAAGTGTAGA AGAGGACACT TCAAAAAATT	3480
35	TACGGGATCG AGTTATTCTT GAATTGTTGT ATGCTACAGG CATCCGTGTT TCGGAATTAG	3540
	TAAATATTAA AAAACAAGAT ATAGATTTTT ACGCGAATGG TGTTACCGTA TTAGGAAAAG	3600
	GGAGCAAAGA GCGCTTTGTA CCGTTTGGTG CTTATTGTAG ACAAAGCATC GAAAATTATT	3660
40	TAGAACATTT CAAACCAATT CAGTCATGCA ATCATGATTT TCTTATTGTA AATATGAAGG	3720
	GTGAAGCAAT CACTGAACGC GGTGTACGAT ATGTTTTAAA TGATATTGTT AAACGAACAG	3780
45	CAGGCGTAAG TGaGATTTCAT CCCCACAAGC TCAGACATAC ATTTGCAACG CATTTATTGA	3840
	ATCAAGGTGC AGACCTAAGA ACAGTACAAT CGTTATTAGG TCATGTTAAT TTGTCAACAA	3900
	CTGGTAAATA TACACACGTA TCTAACCAAC AATTAAGAAA AGTGTATCTA AATGCACATC	3960
50	CTCGAGCGAA AAAGGAGAAT GAAACATGAG TAATACAACA TTACATGCAA CAACAATTTA	4020
	TGCTGTAAGA CATAATGGGA AAGCAGCTAT GGCTGGAGAT GGGCAAGTAA CGCTTGGTCA	4080
55	ACAAGTCATC ATGAAACAAA CGGCAAGAAA AGTGCGACGT TTATATGAAG GTAAAGTGTT	4140

	ATTACAACAG TTTAGTGGTA ACTTAGAAAG AGCTGCTGTT GAATTGGCAC AAGAATGGCG	4260
5	AGGCGATAAA CAATTACGTC AATTAGAAGC TATGCTAATT GTAATGGATA AAGATGCTAT	4320
	TTTAGTTGTC AGTGGAACTG GCGAAGTTAT TGCTCCAGAT GATGACCTTA TCGCTATTGG	4380
	ATCAGGAGGC AACTACGCAT TAAGCGCAGG ACGTGCATTG AAACGCCATG CATCGCATTT	4440
10	GTCTGCTGAA GAAATGGCAT ATGAGAGCTT GAAAGTAGCG GCTGATATTT GTGTCTTTAC	4500
	CAACGATAAT ATTGTTGTCTG AAACACTATA ATAATCAGAG CACGATAAAT AATTACGAGC	4560
	AATTAATTTT AGTTAAAAGA CGGAGGAATG AAATTAATGG ATACAGCTGG AATAAGATTA	4620
15	ACTCCAAAAG AAATCGTATC TAAATTAAAT GAATACATCG TTGGACAAAA TGATGCTAAA	4680
	CGTAAAGTGG CAATTGCCCT ACGTAATCGA TACAGAAGAA GTTTATTAGA TGAGGAATCA	4740
	AAGCAAGAAA TTTCACCTAA AAATATTTTG ATGATTGGAC CAACCGGCGT TGGTAAACT	4800
20	GAAATTGCAA GAAGAATGGC CAAAGTTGTC GCGCGCCAT TTATAAAGT AGAAGCTACT	4860
	AAATTTACTG AGGTAGGTTA TGTAGGACGA GATGTTGAAA GTATGGTTAG AGATCTTGTT	4920
25	GATGTTTCAG TAAGATTAGT CAAGGCGCAG AAAAAATCAT TGGTACAAGA TGAAGCAACA	4980
	GCTAAGGCCA ATGAAAAACT TGTAAAGTTA TTAGTTCCAA GTATGAAAAA GAAAGCGTCT	5040
	CAAACGAATA ATCCTTTAGA GTCACTTTTC GGAGGTGCAA TTCCAAATTT CGGACAAAAT	5100
30	AACGAAGATG AAGAAGAACC ACCTACTGAG GAAATTAAAA CAAAACGTTT TGAAATTAAG	5160
	AGACAGCTAG AAGAAGGCAA ACTTGAAAAA GAAAGGTAA GAATTAAAGT CGAACCAAGAT	5220
	CCTGGTGCTT TAGGTATGCT AGGTACAAAT CAAAATCAGC AAATGCAAGA GATGATGAAT	5280
35	CAATTAATGC CTAAAAAGAA AGTTGAGCGA GAAGTTGCTG TTGAGACGGC AAGGAAAATC	5340
	TTAGCTGATA GTTATGCGGA TGAACATAAT GATCAAGAAA GCGCTAACCA AGAAGCGCTT	5400
40	GAATTAGCAG AACAAATGGG TATCATCTTT ATAGATGAAA TCGACAAAGT TGCGACGAAT	5460
	AATCATAATA GTGGTCAAGA TGTCTCAAGA CAAGGTGTTT AAAGAGATAT TTTACCTATA	5520
	CTTGAAGGTA GCGTTATTCA AACCAAATAT GGTACTGTGA ATACTGAACA TATGCTGTTT	5580
45	ATAGGTGCTG GAGCTTTCCA TGTATCTAAG CCGAGTGACT TGATACCAGA ATTGCAAGGT	5640
	CGTTTTCCGA TTAGAGTTGA ACTTGATAGT TTATCGGTAG AAGATTTTGT AAGAATTTTG	5700
	ACAGAACCAA AATTGTCATT AATTAAACAA TATGAAGCAT TGCTTCAAAC AGAAGAAGTT	5760
50	ACTGTAAACT TTACCGATGA AGCAATTACT CGCTTAGCTG AGATTGCTTA TCAAGTAAAT	5820
	CAAGATACAG ACAACATTGG TGCACGTCGA CTTCATACAA TTTTAGAAAA GATGCTAGAA	5880
55	GATTTATCAT TCGAAGCACC AAGTATGCCG AATGCAGTTG TAGATATTAC CCCACAATAT	5940

AAATATACAA AAGGAGAAAA ATTCATGAGC TTATTATCTA AAACGAGAGA GTTAAACACG 6060
 TTACTTCAAA AACACAAAGG TATTGCGGTT GATTTTAAAG ATGTAGCACA AACGATTAGT 6120
 5 AGCGTAACTG TAACAAATGT ATTTATTGTA TCGCGTCGAG GTAAAATTTT AGGATCGAGT 6180
 CTAAATGAAT TATTAAAAAG TCAAAGAATT ATTCAAATGT TGGAAGAAAG ACATATTCCA 6240
 10 AGTGAATATA CAGAACGATT AATGGAAGTT AAACAAACAG AATCAAATAT TGATATCGAC 6300
 AATGTATTAA CAGTATTCCC ACCTGAAAAC AGAGAATTAT TCATAGATAG TCGTACAAC 6360
 ATCTTCCCAA TTTTAGGTGG AGGGGAAAGA TTAGGTACAT TAGTACTTGG TCAAGTACAT 6420
 15 GATGATTTTA ATGAAAATGA TTTGGTACTA GGTGAATATG CTGCTACAGT TATTGGTATG 6480
 GAAaTCTTAC GTGAGAAGCA TAGTGAAGTA GAAAnAGAAG CGCGCGATAA AGCTGCTATT 6540
 ACAATGGCAA TTAATTCATT ATCTTATTCT GAAAAAGAAG CGATTGAACA TATCTTTGAA 6600
 20 GAACTTGGCG GTACGGAAGG CCTATTAATC GCATCAAAAG TTGCAGATAG AGTTGGTATT 6660
 ACTAGATCTG TAATTGTAAA TGCACTACGT AAATTAGAAA GTGCTGGTGT AATTGAATCA 6720
 CGTTCTTTAG GAATGAAAGG TACTTTCATT AAAGTTAAAA AAGAAAAATT CTTAGATGAA 6780
 25 TTAGAAAAAA GTAAAT 6796

(2) INFORMATION FOR SEQ ID NO: 3:

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 2073 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

ATCCTAAAAT TnAAAATTAT CACGCCTTTT GaACAGCTTT GTAACCaTct GGACGATCAT 60
 40 kAAATTCCaA TGTAATCCTT GGTTTAAaGT TGATCTTTAA CCTTATTTAA AycACCAATT 120
 GTACGTATAT TATGTTGTTT AGCAAAATCA CGTTTTACAG CTAAAGCATA CGTATTGTTA 180
 45 TACTTCATTG GTTTTAACAT AGTCATTGTA TATTTCTTTT CAAGACTTTG CTTAGCTTGT 240
 TCATAAACTT TTTTCTCTTC TTTGACTTC AATGGTTCTT TTGTTAATTC ACCTAAAACT 300
 GTTCCAGTAA ATTCTAAATA CCCATCTATA TCGTCAGATT TTAAAGCATT AAATAAAAAAT 360
 50 GCTGTTTTGC CCATACCATC TTCACTTCT ACAGTATTTT TGGTCTCTTC TTCTATTAAA 420
 ATTTTATACA TATTTGTAAT AATCGATGGC TCGGAGCCAA GCTTTCCAGC TAACGTAATT 480
 TTATCACCTT TTTGTGCAAA CATAGGAATA GCGATAGCCA GTATAATAAT CATCACTATA 540

55

	TCAAATATAA TTGCCAATAA GGCTGCTGGA ATTGCACCTA ATAATATCAA CGATGCATTG	660
	TTACGGTCTA TACCTAATAA AATTAAATCT CCTAGTCCGC CTGCACCAAT TAATGCTGCT	720
5	AGTGTGCTG TACCTATAAT TAATACCATA GCCGTTCTTA CACCAGCCAT TATAACAGGC	780
	ATTGCTATCG GAAGTTCGAC TTTAGTTAAA CGTCTAAATG GTTTCATACC TATACCTTTA	840
	GCCGCTTCAA TGAGTGATGG ATCAACTTCT TTAATTCCAG TATACGTATT CCTTAAAATT	900
10	GGTAACAACG CATACACTAC AAGTGCAATA ATTGCTGGCA CACGACCGAT ACCAAATAAA	960
	GGAATCATT AACCTAATAA TGCCAACGAT GGTATGGTTT GAAGAATTGC CGCAATATTC	1020
15	ATTACGATTT CAGATATCGT TTTAGTCTTC GTTAATAAAA TACCTAATGG TACCGCAATA	1080
	GCAGTTGCAA TCAATAATGC GATAAATGAT ATTTGAATAT GTTCTATCAT TGTCGAAAAG	1140
	AGTTGCCCT TACGTTCACT CAATATGTCg AAAAAGTTAG TCATGTTGAG CTACCTCCTT	1200
20	TTTCTGGGAC AAATATTTGA AGATATCTTT CCTATCAATA ACATATTGAC CTACGCTATC	1260
	TTCTTGCATG ACAATGACAC GCTCGCTCTC TGATAAAAGT TGATACAATA CTTCAATTGG	1320
	TTGATTGTCA TAAACAATTG GATAAGCGCT CATAGATGTA ACCTCATCGA TTGGTTTCAT	1380
25	AATATCCAAG TCACGGATAA TTGCGTTCTC TTCAACACAT GGCGCATCAT CTTCTAAATG	1440
	ACTACCCATA AATTGTTTAA CAAATTCACT TTGAGGATTA TTTTAAATC CTTCTGGTGT	1500
30	GTCAATTTGT TCAATATGCC CTTCAATCAA AAGACAAATC TTATCACCAA GTTTCATCGC	1560
	CTCTTGAATA TCATGTGTAA CAAATATGAT TGTCTTCTTA ATTTTAGTTT GTAATTCAAT	1620
	TAAATCATCT TGAAGTTTTT CTCGGCTGAT TGGGTCTAAT GCACTAAACG GTTCATCCAT	1680
35	TAAATAACT GGTGGATCAG CTGCTAACGC ACGTATAACT CCTACACGTT GTCGTTGCCC	1740
	CCCTGACAAT TCATCAGGTT TTCTGTTTTT ATATTTTCA GGTCTAATC CAACCATTC	1800
	AAGTAATTCA TCTACTCTTT TATCTATATC TTTTCTTTC CACTTTTCA TTTGTGGCAC	1860
40	TTGTGCAATa TTTTCTTTGa wTGTCaTATG TGGAATAAT GCAATCTGCT GCAATACGTA	1920
	TCCAATATCC CAACKATTT CGTATACTGG ATAATCACTT ATTGGTTTAT CTTTAAAATA	1980
45	AATATAACCT TCACTTAAGT GAATGAGTCG ATTAATCATT TTTAATGTCG TAGTTTTTCC	2040
	ACAACCTGAA GGTCCAATTA GCACAAAAAA TTC	2073

(2) INFORMATION FOR SEQ ID NO: 4:

- 50 (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 13321 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear
- 55

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

	ACTATTCTAG CTTCATCAGT TATCATATAT TCTTTGAAAC ACTTGTAAGA AAATATAATG	60
5	AGTATTTACT ACATAATGAT ATTTCAAATT AGAAAAAAGG AAGTTATGAT TTAATGGCCT	120
	TGAGCCTATC ATAACTTCCT TTTATCATT TATTGTTGTG TTGATGTTTC GATAACGTGG	180
	TACATCTTAT CAAACATCAA TTCGAAACCA TGCACCATGG CATCATGATA TTCTTTTTTC	240
10	TTTTGCTTGT ATTCTAAATT AGTAAATCGT CTTTCTTTT CAACTAATGA ACGATAATAA	300
	AATAGCATT GGGTGCCACC TGTTTCACGT TCAAAAAATT CTACCTCAAT GACATCTTGC	360
15	GTTTCACTTA GTCCAGGCAT ACCGATAGTC ATCTTAACGT ATTCATCCAT AACTAAAGAT	420
	TCATAAATGC CTTCAATCAC ATTTACTTTG CCATTACGTT GTTGATCTAC AATACGATAT	480
	TTACCGCCTT CTTTAACGTC CGCTTCAATC TCTTTATTCG TTCTGGCTGA TGTCATAAAC	540
20	CATTGTTTCA ACAAATCTTT CTTTGTCCAA GCTTCGTATA CTAACCTCTGG AGAAAATTTA	600
	TAAAGCTTTT CAATTTCAAC TTCGACATGT TCATTCTCTA CATTAAATTT TGCCACTGTT	660
	GTCCACCCAC TTTGCTCTT ACTTTTATT TAACGTATTT TTGCTCAGTT CCAAACATAG	720
25	ATGATCATCA TTTTAAAAG ATTAGCGTTA TACGGTGAGT ACAACATGAT CTGTTAATAT	780
	AACAAGCCAC CTTACTTGGC TACATCGATA TATTGTTAAG CATTAAATGTT TCATTTCTTG	840
30	ACTAGTGTTT TTTTTTAGCT TTGAAAATT AAATAAAATC GCAATAAGTC CGCATACACC	900
	TAATAATATA GGATAAATGC TGTATGGGAA TAACATTAAAC GGTGAAATAC CAGCTACACC	960
	AGCCGCTGaA ATGACTTGCG GGCTATATGG TAATAAACCT TGGAAGCAGC CTCCAAATAT	1020
35	ATCAAGAATA CTTGCTGATT TCCTTGAATC TACATCATAT TCATCTGCAA TATTTTTAGC	1080
	TAAAGGACCT GACATAATAA TAGAGATGGT GTTGTTTGCC GTGGCAATAT CTGCGACACT	1140
	TACCAACTA GCAATTCCTA ATTCTGCGCC ACGCTTTGAT TTCACTTTAG AGCGAACAAA	1200
40	TTGCAACAAC CATTCAATAC CACCATGTG TTGAATAATA CCGACTAAAC CACCAATTAG	1260
	CAACGCAATC ATAGCAATAT CTTCCATGCT TATAATACCT TTGGACACTG CATCTAGTAG	1320
45	CCCCATCCAA CCGAATGAAC CATCTATGAG ACCAATGATT CCGGCTAATA ATGTTCCGCC	1380
	AATCAATACG ATAATGACAT TTACACCTAA TAATGCTAAT ACCAATACTA AGATATACGG	1440
	TACAACTTTA ATTAGATTAT AATCATAGT TTTAGCATGA TTAAAGAAA TGCCATTCGT	1500
50	TAAGAAATAC AGAATAATAA TCGTTAAAT AGCACCTGGC AATACAATTT TAAAGTTTAC	1560
	TCTGAATTTA TCTTTCATT TCGTATGTG TGTTCTAACC GCAGCAATTG TTGTATCTGA	1620
55	AATCATTGAT AGATTATCGC CGAACATTGC ACCTCCAACA ACTGTAGCCa tTGctAGCGC	1680

EP 0 786 519 A2

	TCCTACAGAC	GTCCCATAG	ATATAGAAAC	AAACATACAA	ATCACAAACA	ATCCTACAAT	1800
	AATTAAATTT	TCTGGGATTA	ATGATAGTCC	TAAATTAAct	GTCGACTTTA	CGCCACCCAT	1860
5	TTTTTCAGCT	GTATTTGAAA	ATGCACCTGC	TAAAATAAAA	ATCAACATCA	TTAAAAAAT	1920
	GTTTGAATGG	CCTGCACCTT	TCGTGAAGAC	CTCAACTTTT	TTAGCAAATG	ATTCTTTTCG	1980
10	ATTCATTAAT	AACGCCACAA	TTACCGTTAT	CGTAATTGCA	ACATTTAATG	GCATTGAAGT	2040
	AAAATCACCT	GTGATAATAC	CTACGCCTAA	AAACAACGCC	ACAAATAATA	ACAAGGGGAA	2100
	TAATGCCCAA	GCATTGCTCT	TTTTATGTAC	TTCCATCCTT	TTTACCTGCT	TTCCAATTAA	2160
15	AAATACCTCT	TTCTCACAAA	CGATGAAGAA	AGAGGTTTTT	ATGTGCTTTA	CCTGCTTATC	2220
	TTCAAACCAT	TACGGTTACT	GGAATTGGCA	CATTGAGAT	GTTGCCGAGG	CTTCATAGGG	2280
	CCAGTCCCTC	CACCTCTCTA	GATAAGTGAT	GCTTATTTAC	GTTTACGTTA	CAAGATAATC	2340
20	CTTAGTACGT	CAATCATAAA	TTAATCAGGA	GTCTGATAAT	ATTTTTCATA	AACAATCATT	2400
	GCTACTGTAA	TAATAATCAA	AACAATAATG	CTAATAACAA	GTAAAAGCCA	CCATTTAAGC	2460
25	ATTAATGCAA	TAAAAATGAA	CACGATAGAC	ACACTTACTA	ATATTAATGA	TATGACTTTA	2520
	AATTGCTGAA	CACGTTGCTT	GGAGATGACT	TTCAACTGTT	TGTTTGATAG	ACGCGTATTT	2580
	TTTATACTGA	TTCCAGTAT	ATTTTCTAAT	ATTTGAACCA	ATACGATACT	TATTGCAAAT	2640
30	ATAATAATTG	GTAAACATC	ATAGCTCCCT	ATAGTTAATG	TATAAATTAC	AAATCCAATG	2700
	TAAAGTAACC	CTGAGACAAA	GGATAAAAAG	TATGCGACGT	ATTTGTTAAA	CTTAATGATA	2760
	TGCTTTTTTAA	CGTTTTTGATG	TGTAAACCAT	ACATTGAAA	CGATCGCAAC	TGCTACAAAT	2820
35	AATGTGAATA	CTATATATAA	TGGTAATTTT	TGTTGAGGAA	AAACAGTCGC	TATTCCAAAA	2880
	GCTAATGCTA	AAATCAAAAA	TAATATAGCT	CTAGATACTA	TTAATGCCAT	AATAACAACC	2940
	CCTTTGTTTA	ATATCGAGTT	TGCAAATTTA	CGTTTATCAG	CGTTTCTATG	ATCAGTACTT	3000
40	CTACGGGTAG	CGTTTCTATG	TAATTTACAT	CATCTTAACA	TATAAATACT	TCGCTATTTA	3060
	ATTGAAAACA	TATCCTATTA	TTCTTTGTCC	GTTCTGACGT	TTAATATCTA	GCCTTAGGCA	3120
45	TTTCACTTGT	TAATGAATTT	AACCTTCTTC	CACTAACCGT	CCCTAAACCC	AATCCCGCAA	3180
	CAGTTTTTAA	CTTTTTTCGTT	GTTGTCCTGA	CATCCTCATT	AAGAAAAGTTT	ATTCTGCTTA	3240
	AAACTTATAA	TCCACACCCT	GAGCAAACGC	TCCTTATGAC	AGAGTATTAA	AATAAGCCGA	3300
50	TAAAGATACA	CACCTTTACC	GACTATTTAA	AATACACTTC	ACCAATTCAT	TTTAATTTAA	3360
	TGGATTGAAG	TAATAAATT	AATATTATGT	TGTTCAATTA	AAAGCTTCAT	ACAAACCTAA	3420
55	TCTATTTGCA	CTCCACCGCT	AACACCGAAC	ACTTGTCGGG	TTGTATAACT	TGATTCTTCT	3480

EP 0 786 519 A2

	GTTTTTTGAC	CAAATGTTGG	GATTTTACTT	TGAGGTTGTC	CACCAGAAAT	TTGTAATGGT	3600
	GACCAGAATG	GACCAGGCGC	TACACAGTTC	ACTCTAATTC	CTTTTGGTCC	TAATTCTTCT	3660
5	GAAAACTTT	TAGTTAATGA	AATAATTGCT	GCTTTTGAAG	CGGCATAATC	ATGAAGAATA	3720
	GGACTAGGAT	TATAACCTTG	TACAGATGAT	GTCGTTGTAA	TTGACGCACC	CGGTTTTTAA	3780
	TATTCCAATG	CTTTTGAAC	TGTCCAAAAT	AGCGGATAGA	CATTGTTTC	AAATGTTTCT	3840
10	GTAAATGCCT	CAGTTGTAAA	TCCATGAATA	TCATCATGAT	ACTGTTGATG	TCCAGCAACT	3900
	AAAGTAACAT	TATCTAAGCC	ACCTAATTGT	TGATATGCTT	GTTCAACAAG	GTCATAGTTG	3960
15	AACTGTTTCT	CTCTTATATC	ACCAGGAATT	AACACTGCCT	TTGACCACT	TTCTTCAATC	4020
	ACTTGGCGTA	CTTCTGTGTC	ATCTTGTTCT	TCACTCGGAA	GATAGTTAAT	CGCTACATCT	4080
	GCACCTTCTT	TAGCATACGC	AATTGCTGCT	GCACGCCCTA	TTGCTGAGTC	ACCACCTGTG	4140
20	ACTAATATTT	TATAGCCTTG	TAAGCGTTGA	TGACCTTGGT	AAGACGTTTC	GCCACAATCG	4200
	GGTGCTGGCG	TCATTTTCTA	TTGTAAACCC	GGTACCTCTT	GTTCTTGTTT	TTCATAATCC	4260
	GTTGTTTTAA	ATTTTGTCT	AGGATCTTGA	GCTGCCATTT	TTTTACATCT	CCTTATTCGC	4320
25	TTAATGGTTA	TTATTTACCC	AATCTTCCTA	GGAACCTAAT	CATGATTACA	CTAAAAATTA	4380
	CTTTCTTCTT	TATAAAAACA	AGCTCGAATT	ATTCATGCAA	TAGTCTCTTT	ACAAATTCAA	4440
30	CAAAATACTC	AGGTACTTTT	TCCAGAATCC	TTTCATCCGG	TTTATATTGA	GGATGATGTA	4500
	AATCATATTC	ACTATGAGAA	CCAATTAACG	CAAATACACT	TGGAAAATGT	TGACTATAAC	4560
	CTGAAAAATC	TTCTCCAATC	GTAAGCGGCT	GTTCCATCAT	TCCCACCTTA	TATCCAACAT	4620
35	GTTGGGCTAC	TGCAATTGCT	TTATGCGTCA	ATGCCTCATC	ATTCATCACA	GCGCCAGGTA	4680
	AATGCGTATA	ATTTAAATTA	ATTTTCATAT	TATATGCTTG	AGCCAATCCG	TCCGCAATAT	4740
	CTTGTAATCG	TGTTTCTACA	AGCTTTTCGT	CCACAGGATC	AAAACCTACG	ACTGTGCCTT	4800
40	GTACATACGC	ATGATCAGCA	ATGACATTCC	AAGTATTACC	ACATGATATT	TGTCCAATTG	4860
	TTACTACCGC	TTTCATCAAC	GCAGATAGAT	TTCTACTAAC	TATGGATTGA	ATACTATTAA	4920
	TCAATTGCGC	CAACACAATA	ACTGGATCGT	TGCATTGTTC	TGGCTTTGCA	GCATGACCAC	4980
45	CCACGCCTTT	AATATGAAAC	TCAAAACGAT	CTACTGCTGA	TGTAATTGCC	CCTGTTTTGA	5040
	TTGCAAATGT	ACCTACCGAA	CGCGATGGGT	CATTATGAAA	ACCCAATACT	GCTTGTACAT	5100
50	CTTTTAATGC	ATGTGTTTCA	ATAATTTTAA	AAGCGCCATG	TCCTAGTTCT	TCTGCTGATT	5160
	GAAAAATGAA	TTTAACACGC	CCAGTAAGAG	TGCCCTCAAT	TTCTTTTAAT	TTTACAGCTG	5220
55	TAGCCAAAAT	ACTAGCCATG	TGAATATCAT	GACCACACGC	ATGCATAACA	CCTTCATTTT	5280

	CAGCTATACA ACTCAGACCT TGTCCCACTT CAGCAACAAG CCCAGTCGCA AGTGGTAAGT	5400
	CTAATATTCT AATATGATGT TCTGTTAAAA TATCTTTAAT TTTTGTGTGA GTCTTAAATT	5460
5	CTTTATCGGA TAGTTCCTGGA AATTGATGAA AATACCTTCT CCAGGTAACA GCTTGATCTT	5520
	TTAATCCCAT CGGTCATTCC CCTTCCTTAA GTCAATGATA TGTTGTCTAC CCTACGATGA	5580
10	TCATCTTTGA CTATTAAACG ATGATTTCAC AACAAATGTAC TCTTGTTAAT TGCTTTCGTT	5640
	AATGATAGAC AGTTGTTTAA TAATATCGTA ACACTGTTGT CAAACTATTTC TAACTTTTAT	5700
	AATTGAGACT CTATACAAAA ACGTGTCTC GAATATACTT GTTTTTACAA ACCACAAAAA	5760
15	GCTCTAAACA TTAGTTTAAA CCAATGCTTA GAGCTTCTA ATTATTTTAT GCTTTAAAG	5820
	ATACTGTGTT ATCTACGATG ACCTTACCGT CTTTAATAAC TTTTCTGCG TGATTGATAC	5880
	CAAAATGATA TGGAAATATAT TCATGATTG GTGCATCCCA AATTACTAAA TTAGCCTTAT	5940
20	CACCTGTGTT AATTGTACCC GCGTTAATGT CTATTGCTTT AGCAGCATTG ACCGTAACAG	6000
	CATTCCAAAC TTCATTAGGT GATAGCTTTA ATTTCAAGGC TGCAATCGCC ATAACAAGTT	6060
25	GTAAGTTGTT TGTGACACTA CTACCAGGGT TATAATCAGT TGCTAATGCA ATCGCACCCT	6120
	TATTGTCAAG CATGCCTCTT GCATCTGCAT AATCTTCTTT ACCTAAATAG AACGTCGTTG	6180
	CAGGTAAGAG GACAGCTACA GTATCACTAT TTCGCAACTT TTCTTTTCCT TTATCACTAG	6240
30	AAGCTACTAA GTGGTCTGCT GATATTGCTT GTTCATCAAT TGCTAATTCC AGTCCGCCTA	6300
	ACGGATCAAT TTCATCCGCA TGTATTTTCA CTTTAAACC TGCTTCTTTG GCTTTTTGCA	6360
	TATAATGTTG CGATTGTTCT ATTGTAAATA CACCTGTTTC ACAGAAAATA TCCGCAAAGT	6420
35	CTGCATATTG TTTTACTTCC GGAAGTAACG CAATCATTTT TTCTAAAAAT GCCTCATTTG	6480
	AACCTGCCTC TTAGGTACA GCATGAGGCC CTAGGAAAGT ATGTTTCATG TCTAAATCAT	6540
40	ATTCTCAGC TAAACGATTA GACACTTTCA ATTGCTTCAG TTCATTTTCT CTATCTAATC	6600
	CATAACCACT CTTACTTTCA ACTGCAAGCA CGCCGTGTTT AATCATAGTA AGCAAATCAT	6660
	GCTCTGCTTT TTTAAACAAG TCATCTTCGG ATGTTTCTCT AGTAGCATTG ACGGTAGATA	6720
45	ATATGCCACC ACCCATTTCT AATATTTCAA GGTAAGACTT ACCTTGACGT TTTAATGACA	6780
	TCTCATGTTT TCGAGATCCA CCAAATGTTA AATGGGTATG TGCATCTACT AATGCTGGGG	6840
	ACACTACCTT CCCACTAGCA TCAATCGTCT CAGTCGCATC GTAGTCATCT GTATGTGTTT	6900
50	CAGCATATAC AATTTTGCCA TCTTTAATGA CAACTGTACC ATTTTTCACA ACATTTAATT	6960
	CATCTAATTC CTTACCCTTC AAAGGTTTAT CTGTTGATCT CGGTAAAATT AATTCTGCTA	7020
55	TATGATTAAT TATTAAATCA TTCATTACTT ATCACCTGCT TTATCAATCA TTGGAATATG	7080

	AACACCCATA	CCTGGGTCAG	TCGTCAATAC	ACGTTCCAAT	CTTCTTTCAG	CACGCTCTGA	7200
	TCCATCTGCT	ACAACAACCA	TACCCGCATG	AAGTGAATAT	CCCATGCCAA	CACCGCCACC	7260
5	GTGATGGAAT	GAATCCATG	AACCACCTGC	AGCTGTGTTA	ATGAGTGCAT	TCAATACAGC	7320
	CCAATCACCA	ACCGCGTCAC	TACCATCTTT	CATACTTTCT	GTTTCACGGT	TAGGACTAGC	7380
10	AACTGAACCA	GCATCTAAAT	GGTCTCGTCC	AATAACAATT	GGTGTGAAA	TTTCACCGTC	7440
	ACGTACAAGA	CGATTTAAAG	CTAAGCCCAT	TTTCGCTCTT	TCTCCATAGC	CTAACCAAGC	7500
	AATACGTGAT	GGTAGTCCTT	GATATGAAAT	TTTTTCTTCA	GCTAAATCAA	GCCATCTTAA	7560
15	TAACTTTTC	TTTTCTGGGA	AAAGTTTGCG	CATTCTTCA	TCCGCACGCT	CGATATCTTT	7620
	TGGATCACCA	CTCAACGCAG	CAAAGCGGAA	TGGCCCTTTA	CCTTCACAGA	ATAATGGTCT	7680
	AATGTAAGCT	GGTACAAAGC	CTGGGAAGTC	AAAAGCATTT	TTCACTCCGT	TATTGAAGGC	7740
20	TACTTGACGA	ATATTGTTAC	CATAATCAAA	TGCTACAGCG	CCACGTTTTT	GGAATTCAAG	7800
	CATTAATTCA	ACATGCTTTG	CCATTGAAGC	TTGTGACAGT	TCAACATATT	TTTTCGGATC	7860
25	TTTTTCACGC	AATACTTTCG	CTTCTTCTAC	AGAGTATCCT	TGTGGCACAT	ATCCATTTAG	7920
	CGGATCATGT	GCACTTGTTT	GGTCAGTAAT	AATGTCAATT	TTAAATCCTT	TTTCTAGAAT	7980
	CGCTTGATGG	ATGTCTACAG	CATTTCCAAC	TAACCCGATT	GATAATCCTT	CTCCACGTTT	8040
30	TTTCGCCTCT	TCTGCTAATT	TTAATGCTTC	ATCTAAATCA	GCTGTTTTAA	CATCACAGTA	8100
	TTTCGTATCA	ATTCGCTTAT	CAACACGTGT	TTCATCAACA	TCCACGCAA	TTGCTACCCC	8160
	ATGATTCATA	GTAATTGCTA	ACGGTTGCGC	ACCACCCATA	CCACCTAAAC	CTGCTGTCAG	8220
35	TGTAACAGTG	CCTGCTAAAT	CTCCATTAAA	GTGTTGATTA	CCTAGCTCGG	CAAATGTCTC	8280
	ATAAGTACCT	TGCACAATAC	CTTGAGAACC	AATATATATC	CAACTACCGG	CTGTCATCTG	8340
	TCCATACATG	ATTAAACCTT	TTTTATCTAA	TTCAITAAAA	TGATCCCAGT	TTGCCCATTC	8400
40	AGGCACTAAT	ACTGAATTTG	AAATTAATAC	ACGTGGCGCT	TCTTCATGTG	TTTTAAATAC	8460
	AGCAACTGGC	TTTCCTGATT	GTAATAACAT	TGTCTCATCT	GATTCTAATT	CTCGTAACGT	8520
45	TTTCTCTATT	GCTTCAAAAG	CTTCCCAATT	ACGTGCTGCT	TTTCCAATAC	CACCATAAAC	8580
	AACTAAATCT	TCTGGTCTTT	CAGCAACTTC	TGGGTCTAAA	TTGTTGTATA	ACATTCTAAG	8640
	TACTGCTTCT	TGTTCCCAAC	CTTTACACTC	AATACTCAAA	CCTTTTTTTG	CTTGAATTTT	8700
50	TCTCATAAAA	TTGCTCCTG	TTCTTTTAAG	AAGTTAATTC	CACTAAATTT	AAAACGCTTA	8760
	CATTATTATC	TTCAATATTC	ATTATAGTAT	GTTAAATAT	AGCCAACAAA	TATAAATAAA	8820
55	CTAATTATCC	ATAGCTTGAA	TCTATAAATA	AAAGGAGCAA	AACACATGAA	AATTATTCAG	8880

	CATATTAGCC AGCCATCTTT AACTGCTACG ATTAAAAAAA TGAAGCAGA TTTAGGTTAT	9000
5	GACTTATTTA CACGTTCAAC AAAAGACATC AAGATTACCG AAAAAGGAAT ACAGTTTTAT	9060
	CGTTATGCGA GCGAATTAGT TCAACAATAT CGATCCACGA TGGAAAAAAT GTATGATTTA	9120
	AGCGTTACAT CAGAACCAAG GATAAAAATT GGGACTCTTG AATCTACGAA TCAATGGATT	9180
10	GCGAATTTAA TTCGAAAGCA CCATTCCGAC TACCCTGAAC AGCAATATCG TTTATATGAA	9240
	ATACATGATA AACATCAATC TATAGAGCAA TTACTGAATT TTAATATTCA TTTAGCTATA	9300
	ACAAATGAAA AAATAACCCA CGAAGATATA AGATCCATTC CTTTATATGA GGAATCTTAC	9360
15	ATTTTATTAG CACCCAAGGA AACATTTAAA AATCAAAATT GGGTAGATGT TGAAAATTTG	9420
	CCACTCATAT TACCAAACAA AAATTCTCAA GTGCGCAAAC ACTTAGATGA CTATTTTAAT	9480
	AGAAGAAATA TTCGTCCAAA TGTCGTTGTA GAAACAGATC GATTCGAATC AGCAGTTGGA	9540
20	TTTGTTTCATC TCGGCTTAGG TTACGCTATC ATTCCGAGAT TTTATTACCA ATCATTTCAC	9600
	ACGTCTAATT TAGAATATAA AAAAATTCGT CCAAACCTAG GCCGAAAAAT TTATATCAAT	9660
25	TACCATAAAA AACGCAAACA CTCCGAACAA GTACATACAT TCGTACAACA ATGCCAAGAT	9720
	TATTTATATG GACTTTTAGA GGCTCTTTAA CTTAAGTTAT TAGAGCCTCT TATGCAGTTG	9780
	CTCAGTCAAC TGTATACCTT TTGCCTTTAA CTTAAGTTAT TAGAGCCTCT TATGCAGTTG	9840
30	CTCAGTCAAC TGTATACCTT TTGCCTTTAA CTTAAGTTAT TAGAGCCTCT TATGCAGTTG	9900
	CTCAGTCAAC TGTATACCTT TTTCCTTTAA CTTAAGTTAT TAGAGCCTCT TATGCAGTTG	9960
	CTCAGTCAAC TGTATACCTT TTGCCTTTAA CTTAAGTTAT TAGTGCCTCT TATGTAGTTG	10020
35	CGTAGTCAaC TGTaTACCTT TTGCCTTTAA CTTAAGTTAT TAGAGCCTCT TATGCAGTTG	10080
	CGCAGATCAT CGTATAAAAA TTAATGACGT CATTTCAAAA ATCGATACAA AAATAATTTA	10140
40	TTATAAAAAAT TCTAAGAAAG AAGTGAAGCA GATGTTAAAA TCTATTAATC ATATATGCTT	10200
	TTCAAGTCAGA AATTTAAACG ATTCAATACA TTTTATAGA GATATTTTAC TTGGGAAATT	10260
	GCTATTGACT GGTAAAAAAA CTGCTTATTT TGAGCTTGCA GGCCTATGGA TTGCTTTAAA	10320
45	TGAAGAAAAA GATATACCAC GTAATGAAAT TCACCTTTCA TATACACATA TAGCTTTTAC	10380
	TATAGATGAC AGCGAATTTA AATATTGGCA TCAGAGGTTA AAAGATAATA ACGTGAATAT	10440
	TTTAGAAGGA AGAGTTAGAG ATATTAGAGA TAGACAATCA ATTTACTTTA CCGACCCTGA	10500
50	TGGTCATAAG CTAGAATTAC AACTGGCACC ACTTGAGAAC AGATTAAATT ATTATAAAGA	10560
	GGCTAAACCA CATATGACAT TTTACAAATA AGGTGTCAAT ATAAAAAGGC CTCTTGAAC	10620
55	CCGTTAAAAAT TTTAATTAAT TATTATATAA TAAGAGAACT TTTCAAACAA TACAGTTGTT	10680

EP 0 786 519 A2

	TTACTGCAAT TATTTTTTCAA ATATATCAAC GTTAATATAA CTTCTATTAA GAAATACTCA	10800
	CATTCTGCCC TGCAATGCAA ATCTCGTCAC ATATAAATAT TTTTAATTAT TTTAAAAAAT	10860
5	GATGCACTAA ATTAGCAACG AGCTTAGCAG TTCTATTGTC AGCGTCATAT GTTGGATTCA	10920
	TCTCAGCAAT ACTAACTGAA GACACCTTAT CACTTGGAAT AATACGTTTT GCTAATTCAA	10980
10	GAACAGTATG TGGATACAAA CCTAACACTG CCGGCGCACT TACCCAGGC GCAAACGCAC	11040
	TATCAATGAC ATCCATACAA ATCGTAAACA TAATGACATC ATGTTTCATGT ACAAACGTT	11100
	CAATCATATC TTTAATTGTT GGTGATACGT GACTCAATAA TTCATCTGCA AAGACATAAT	11160
15	CAATCTTTTT CTCTTTAGCA TAATCAAATA AACTTTGCGT ATTACCACCT TGAGCAATAC	11220
	CAAGCACTAA ATAATCTGTG TTTTCATCTT CTTCTAAAAT TTGTCTAAAG CTCGTTCCAG	11280
	ATGTAGATTG TTGTTGAGCA CGTGTATCAA AATGCGCATC AATATTTATC ACACCAATAG	11340
20	ATTGTGTTGG ATAGACTTTA CGTGTGCTA AATATTGAGC ATACGCAATA TCATGTCCAC	11400
	CACCTAATAA AAATGTTTGT CTATGATTAG CAATTGACTT CGCTGCAAGC ATAGCAAATT	11460
25	CTTTTTGAGT ATCAATTAAT TCCTCATGAT CATGATAAAC ATTTCCGTAA TCGACTAAAG	11520
	TTcACATTGA TTCAAATCCG GCAAACCTGC AAATGCTTGT TTAATCGCAT CTGGTCCTTC	11580
	TTTTGCACCA ATGCGCCCTT TGTTTAAAGC AACACCTTTG TCAACAGCAT AGCCTAATAT	11640
30	ACCGACCCCT GATGGCATAC TACTCTTTTC CAGCTTAGAC AAATCTTCAA ATGTTACTGT	11700
	TTGAAAATGT CTAAATTTTT TCGGGTCTGT TTCACTATCT AACCTTCCAG TCCATAAATT	11760
	TGGTTCACCT TGCTTGTA CAAGCATTTCC CCCTCTTATT TATGTGGCTT ATTAACAATT	11820
35	AAAGTATAAC GTATAGGAAA TTTTGAATTC AATTCATAGT TAAATCCGTA TCTTAAAAAT	11880
	ACTTATCTAC ATTACTTTTA CCCCTATTTT CTATGTAATA ACGAATACTT AGCTGATTTA	11940
40	TGTTAATAAA ATACGTCAAG ACTATTACAT TTTCATTAAT ATTGACATAG ACAATTTATC	12000
	TCTCGGCTTG TAATATGTAT AATTGTTACT AAAAGATATT TTGCTTGTTA CCTAATGGAG	12060
	GTTACATATA ATGAAGAACA ATAAAATTTC TGGTTTTCAA TGGGCAATGA CGATTTTCGT	12120
45	CTTCTTTGTC ATTACAATGG CGTTATCCAT TATGCTCAGA GATTTCCAGT CTATAATTGG	12180
	TGTCAAACAC TTTATATTG AAGTTACAGA TCTAGACCA TTAATTGCTG CAATCATTTG	12240
	TATACTCGTT TTCAAATATA AAAAGGTCCA ACTTGCAGGT TTAATAATTCT CAATCAGCCT	12300
50	GAAAGTAATT GAACGTCTAT TGCTAGCTTT AATTTTACCT TTAATTATTC TAATTATTGG	12360
	TATGTACAGC TTTAATACAT TTGCAGATAG CTTTATTTTA TTACAATCAA CAGGCTTATC	12420
55	AGTACCTATT ACACACATTC TGATTGGACA TATTCTGATG GCGTTCGTAG TAGAATTCGG	12480

	TGTTGTTGGT TTGATGTATT CAGTTTTCTC AGCAAATACA ACTTATGGTA CAGAATTTGC	12600
	TGCTTATAAC TTCCTTTATA CATTCTCATT CTCTATGATT CTTGGTGAAT TAATTAGAGC	12660
5	GACTAAAGGA CGTACAATTT ATATTGCAAC GACATTCCAT GCTTCAATGA CATTCCGACT	12720
	TATTTTCTTG TTTAGCGAAG AAATCGGCGA TCTATTTTCA ATCAAAGTCA TCGCCATTTT	12780
10	AACAGCAATC GTTGCACTAG GATACATTGG TTTAAGCTTA ATTATCCGAG GTATTGCATA	12840
	TTTAACAACA AGACGAAACC TTGAAGAACT TGAGCCTAAT AATTATTTAG ACCATGTCAA	12900
	TGACGATGAA GAAACTAATC ATACTGAGGC TGAAAAATCT TCTTCAAATA TTAAAGATGC	12960
15	TGAAAAACA GGTGTAGCTA CTGCATCAAC GGTTGGTGT TCTTAAATG ATACTGAAAA	13020
	TACAGTGGCT GACGAACCAA GCATTCATGA AGGTACTGAA AAAACAGAAC CTCAACATCA	13080
	CATAGGTAAT CAAACTGAAT CTAATCATGA TGAAGATCAt GACATCACTT CGGAGTCAGT	13140
20	AGAATCAGCm GaATCAGTTA AACAAAGCACC ACmAAGTGAC gATTTaACAA ACGATTCAAA	13200
	TGAAGATGAA ATAGAGCAAT CATTAnAAGA ACCTGCGACT TATAAAGAAG ACAGACGTnC	13260
25	ATCAGTTGTA ATTGATGCAG AAAACATAT CGAAAAAGCT GAAGAnCAAT CTTCAGATAA	13320
	A	13321

(2) INFORMATION FOR SEQ ID NO: 5:

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 8549 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

40	ATGTGTTGTA AACTTTTATG TTGAAAAAGC TACTTATCTC AATGAAAACA AGTAGCATTT	60
	AATAAATTAA TTAGTATACA GCTAGTTTTT CTAATGTGTC TTTAACTTGA ATTAAGTTTG	120
	ACCGTATTAG AGAGGCAGAT TGATCCATCG TTTGAATTGC TTGTCCTTCA TTTTCGTTCA	180
45	AGCCATTACA AACAACTTCA AACTGTTGTG CCATTTGATC AAGACGCGCA TGAGCTTGTG	240
	TGTTTAAAAAT AAACATATCG TCATAATGTG ATGGCGAATA GATAATTCGT CGTTGTATAC	300
	AAACGTATAA AAACCTTGTC ATATCAACGG TTTTGGCATT TTTAAACCTC TGTGTTTTCC	360
50	ACGCATGTTT GCCCTTATTT AAATAATTTG CCCTTTTTTC GCCCCGAAAA AAAAACACAA	420
	AAAAATAACC ACACTCCTAA ATTAATAGGT GGTGTGGTTT TGTTGATTGT AGGGGTATAA	480
55	AAATAACCGC ATTATTAAAG ATACGGTTAC TCTGTTATCT GTAAATATAA TAGTAGTTTA	540

	AAACAGGACT CCACATAAAA ATCAACTCCT TTATATACCA TAATGATACT ATATTTTCTA	660
	GTTTATTTCA ATTTTTCAGT TTTTAAAAAT GAGTTTCTGT TTTTATTTAT ACGCTTTTCT	720
5	GTTTTCTTTT TAAATTTTAT CTTTTTGTTA TTCCATTTCAT TGTA AAAATTC TATTAAATTA	780
	ACATAAAATT TTTTCATGCCC TATTTTATTT GTTGATGAGA TATCAATGTA AAGACTCAAT	840
10	ATTGTTTTTA AATAGATTTG ATGCAACGAC TGATAAACCG TATTACTATC TGCTATGTTA	900
	TTGGTAAAAT GCATAGAAAA ATATTCTAAT TTATTCATGC AATATATATG GGTTCATTA	960
	TACTTCTTAA TGAGTGATT TATACCTTGC AATACGTCAT TACTTTTAAT AACAATTTCT	1020
15	TTTTCACCTG TCGAAAAAGT CCACTGTTTA TCTCCTATAT TTTCTTTAAT TGTTTTCTTG	1080
	TTGTCAAATT CTAAAAATTAT AGCCCGTAAA CACTCTTCTT TATAATTCTC GTTCTTGAAA	1140
	GTACGAAGCA AAATTTTTAT AAATTCGGTA TTGGTGACTT TTTTATAAGT GTGATATTTT	1200
20	GCAATCTCTT TATCAGTAAA GACTGTTCTT AGTTCGTGAT TATCAAAACT TAAATTCATC	1260
	TTATTCTCTA ATTCATTAAT TTTATCTTGC AAACCAACAT TTTCTAAAAT TTTCTTGTTT	1320
25	ATCTCCCCTA TATCAAAACT CCTTTTCGAA ATTAATTTTG AAAACTCGTC TGCCATTTCa	1380
	ACAGCCTTTT CTTTCCTTTT ATACCTTTTG TTAAATTTAT GAACCACCGT TGCAGCATAA	1440
	TACGATATCC CACCAGATAA AATAGATGAT ATTATCGGTA TGTATATATC ACCTTTCATA	1500
30	TTTCCACCTC TTTTAACACA ATTAAGTATT ATGATACACA ACTTGCGCAA AAAGATGTAG	1560
	ACAGAACATA ATGGCGAACA AAAACAACCA CCCAGTAACT AGTATGGGTG GCGTAGACTA	1620
	TAACAACTCT ATGTTATCAA GATATATGTA TCGAGTGATG GCAAGGAAGA AGTCTCCTGC	1680
35	GGGACCAACA GTCAGATATA TGGCCTCTGC CGGGCTATAT AGTTCACTCC TACTATATAA	1740
	AAGTAAGTAT AACATAAAAA GCACCCCGTA AACTGTTATA CGGGAATGCT AAAGTCATAT	1800
40	ATACTACGGG GAGTAGTATG AAAACTATGC TCTCTATCGT AAGAAAAAAC ACCCAGTGAC	1860
	ATGCTTGGGT GAACAAGGAT AGATGTAAAT AGTTGATGCA TGTGTACACA TCATAACAAA	1920
	AAACTAGCCC GAAGCTAGCT ATAACATAAA AAAATAGGCA AGTACCGAAG TACCTGCCAG	1980
45	TTACGCACAT TTAAATCTTG AGAGTAATGT TAAAAAGTGT ATAGGAATAT TAACATCCAT	2040
	CCAAATAGTT ATTTAATAAC TGTAAGATTC CCTATAATTA ATGTAGCAAA ATTTTATTC	2100
	TAAGTAAATA CTAAATCGTG CTAAACTTAC CAAAACACT TATTCTATTA CCTGCCTTGT	2160
50	CTACCTCTCC TGTCGCTATA TAACGACGTT GTCCACTATT AGCAATATAA GTAATCCATC	2220
	TATAGCCATT GATGCAATAT GCGCCGTCAT ATTTAATTGT TGCGTTATTA GGTAATACAC	2280
55	CTGTAATTCT TGAATTAGTT GAATAGCCGT CCCTTACGTT ATTACCTTTA ACATTGGCAA	2340

EP 0 786 519 A2

	CTGGCACTGG TGGATTTTTT TGGTTTTTAG CTGATGTTTT AACATTACCA GCTACCAAAC	2460
	CACCTATAGG CTTACCATGA ATCGCACCGG CTATTAATTT AGAATACAAG TCATAGTTTT	2520
5	TCTTAATCCA ATCCATATCA TTTTATTAG TAATAAAACC TAATTCAGAT AAACGATAGT	2580
	TTATATTTAT TTCTGCTGAT ACATTAACGT TTAGTAAATC ATTACGAGGT GTTACACCTC	2640
10	TTATTTGTCC TAAGTTATTT TTAATAACAT CTTGTATACT TTTATCAATA GTATCTGCAT	2700
	TGAATTGACT TGAAATAATA ACATGCCCCA CACTTGCACT TTCTCCTGCT GCGTCTAAAT	2760
	GAATCTCTAG AACAAATGTCA TACCCATGTG ATTTAACCCA ATATAAGCCA TAATCTTTAT	2820
15	TATTTCTTAC ATTAACACCG TAAGCAGTAT CTTGATACAT ATCTTGATGAT TGACTTGAGC	2880
	CACCATATAA TGCAACTTCG TGACCTGCAT GTCTTAAATA CTTAGCGATA TTTGGTGTTA	2940
	TATATTTACG GATAAAATCA CGTTCATTG TTCCGTTTCC GACTGCTCCA GGATCGTTAT	3000
20	AACCATGACC GGCTACAAGC ATAATTTTTT TAGGTTTAAAT TACTGCTTGC TTTTGGCAG	3060
	TTGCTTGCTT AATAACGCTT TTAGCTTTAT CTCCAACACT TACTTTATCT GGGAAATTTA	3120
25	ATCTAATAAA ATACATTGGG TCATCGTAAT AATGAACATG TCTTGTAACG GTTTCGGGAC	3180
	CCCAACCAGG TTGCGCAACG CCATTTGTCC AACCTTTACC ATTCCAATTT TGGCCAAACG	3240
	ATGTGAAAGT GTTTAGATTA GCGCTCTCAA CAATTTCAAC ATGTCCaGct CCGCCACCAT	3300
30	ACTTTGACGG GAAAACGACA ATGTCCAAC TTTGCGGTAA AAAGCTATCA TAGTTTTTAA	3360
	TTATTTGCCC GTATTTTCA ATCCTTGCTT TATTATCAAA TGGAATATTA TAAGCGTATA	3420
	AACCTTGTA CcTTTCGCCT GTTGCTATCA TAAAAACAT ATTTGCGTAA TCGTAACACT	3480
35	GAAATCCATA AAACAAATCA GGATTGAACT GCTTCCCTAA TGAATTATCA AACCATTTTT	3540
	CTGCTTGGTT TTTTGTATC AACATTGGTC AACACCTACC CTAAATCATT TGTGTCGTTT	3600
40	ATAFTCGTAG GTGTCATTAC TTCTTTAATT GGCGCTTGCC CTGTTGCTTT TCTATACTTG	3660
	TTTTCAGCTT TATATTTCTT TAGCTTTTGA TTTGCCCAT TACCTTCTTG AGATGTTGGA	3720
	TTATCTTTAT ATGTAGTATA TAAAGCAACA ACTGTTAAGA TAATCGATGA AACACTTTCT	3780
45	TCATCTACTG GTATCGGACT TATACCTTTA TTCGCTAAAA ACTGATTGAC TAATGCTAAG	3840
	ATCAATACGA TGTATCTTGT TATTACTTTT GCATCCATTT GTTTGCTCCT TTTATCCAAA	3900
	ATAAAAAGCC AGTGCCGAAG CACTGACTCT TAACTATTAC TTACACTTAC TAAACCAGAA	3960
50	ACACGACCAA AAGCTATATC CTAAAATTCC CTTAAGCATG GTAATCACCT CCTTTAAATG	4020
	CCAAAAATAG TTTTAAACAA GGCTATAACA AATGTACTTA GAATCGTCCC TATTAATCCT	4080
55	AGAATCCACA TCTTGATGTC TCTAATATTT TTAGCATTTT TCTCTTTATT TTTTTCATCT	4140

EP 0 786 519 A2

	TGCGTTCTCA GACTGTCTTC TATTCTGTCG AATTTTTCAA ACATAGTCTT ATCATTCTCT	4260
	TCTAATCGCG TTAAACGCCA ATCTTGTTTCG TGTCGTTTGG TAAATCCAAA CATTACACCA	4320
5	CCCACTTTAT TCAAATTAAA AAGCCATAAG ATTATAACCT ATGACTCTAG ATTTTCTGGA	4380
	TACTTTTCTC CTGTAATAAT TGCATATTCC TCTTTATCTA TAACTTCCAT ATCTACATAC	4440
10	CACGCTATAT CTTCTTTACT ATATTCTTTC AATTGATACC ATGTTTTAAT ATCTTCGAAT	4500
	GTTGGTGAAA TTAATTTAAG CATTTTCAGT CTCTCCTTTA ACCTCTTCTA ATTTTTTATT	4560
	AAGTGTCA CA AGTTGTTTTG CCATTAGTGC ATTTTGCTTA TTAAGTTGCA TCGATAACTT	4620
15	TGTACTTTGA ACAACTTGTT TCTGCATACT AGCAACCATT TTTCGTAAGA TGTCATCAGA	4680
	AGCGACTGTG TTTTGTCTT CACTGTCAAT CTGTTGATGC AAGTCATCTT TTTCTTCTGA	4740
	ATAATCTTCG TTAAAACTA TTTCCCCATT TGAATATTTA AAGGCTTTAG GTCTAAAAAC	4800
20	TTGAGAGAAA TTTTCTGGTA AATTTTCAAT ATCAATACCT TCTTCAAAGC CACCAATGAT	4860
	AGCGTATGAA ATTATCTCAT TACGCTTGTT AACTAATATT TGCATTATTT TCTCACTCCT	4920
25	ATAATTTTGT TAATTGTCCC TCTATTTGCG TTCGCACCAG AGCCTCTTTG ACTTCCTAAG	4980
	TCGAAATAGA CATCGTTTGA TATAGTTAAA GATGTACGAC TAGATTTAGT TAATCCAAAC	5040
	TCATAAACAC CTCCACCATT TCCATCACCA TCTGGAAGAT TTGAGGGATT CAATGAAATC	5100
30	TTTCCTCCTC CAAAAGGACT GCCAAACTCT GTAAAGTCAC CACCTGGAAA AGTCCCATAA	5160
	AAAATTAATA AAATAAATTG GTCTAACTC TCATTTAAGT ACAATGTAGA GCCCACACCA	5220
	TTTGCTGTTC CATCAAAAAT AACCGAATAC CTTTTATTAA ACTTGTCATC TGCGTATAAT	5280
35	TTAGCGTTAC TTTCGGCCAT ATTAGCTTTT GATTGGGCAC TTTGAACAGT TTCAAAAGGT	5340
	GTATTGTAAT CATTAATAGC TAATTCTGAC CACTCAGACC ATGAACCCGC TTCTTTTCTT	5400
40	TTAACAAATA CTTTATTTGT ACCGTTCCGT CGATAAGTCA TACGCTTGTA ATCTGAAGTT	5460
	ACTACTAAAT ATTCGACAGT ACCGTTAGTA CTAACACCTC TTGGATAATT TATAGCTTGC	5520
	GAAACATAAA TAAATTGGGT TGAATCACCT ATTCTTTGTT CTGGATTATT AAAATCAAAT	5580
45	CCAGTAATCT GCATTATCTT ACCATCATCT TTAGTAATCT TAGCTTTTTC CCAATTTGAA	5640
	GTAGAACCAC TTGTGACTAA ACCACCACTA TTCACTGACT GCTTGAAGGC TTCATGTTTC	5700
	TCATCCATAT ATCGCTTTTG CTCATCGAAT GTTCTTGAAT ATGCTTGCGC TTTATTTTCC	5760
50	AAATCAGATA TATGGCTATT AGCAAGTTGC TTTAATTCAT CTATACTTGA AGATTTTGCT	5820
	ATTGAATAT CTGATAGACC TTTTCTTTA GCTTTTCAA TCAGACTCGC ATAATCTTCA	5880
55	CCATTTTTTA TAGCCTCGTC CATTGCTTTC GCACGATCCA TAATAGTTTT TTCTAATTCC	5940

	TCAACGTTAA ATGTGATAGT TCTCTCGACA ACTACCACGT CTGAATTACC TAATTCTGCA	6060
	ACCGAAACTT GAGCTTGATA ACTTCCATCT CGTTTAATTA CATCATTAGG TAATTGAAAT	6120
5	TTTAAATAC CTTTAAATGG ATCTAATATT TCTAGTGGAG CAACTACCAT GACTCCTTTA	6180
	CCTCGAATCG CTATTCGTGC KTTGATATTT tCTTCACTCA ATAATAACGG TTGATTATTT	6240
10	TTAGTGATAT TAAAAAGAAG AACAGAAGAA TCACTCTCTC CTGTTCTAAA AGTTATATCT	6300
	AGATTTGAAA TATTTCCATA ATGCGCTGTG TTTTCTAAAT TTATAGCTAC AGATTTCTCT	6360
	AAATTACTCA TTAACCTATA ATTCTCCCTT CGTGTAAGT CCATGGCCCT GAACTTGTTT	6420
15	TACTATCATA ATTTTTCAAT AGTATCTCAG CAGATGCTGT AACACTATTA CGAACTAGCC	6480
	TATGAACAAA GCCACCTGTG TTTGAAGCTT CTACATATAA GTTCCAACCA GCTACCCCTT	6540
	TACGTTCACT TGGAAAATCT GTAAAACGTT TTGTATCATC CGTAGTTAAA TAAAACGACA	6600
20	TGCCTACTAT GTTAATATCT GACATTTTTG TGATGAATGA AGGTACTCTC TCCCATTTC	6660
	CACTATTTTT AGGCACATAA TTCCAGTCCG AAATGTCTCC AGTTCTTCCA GAAAGCACCC	6720
25	TTTCAAAAGT CATCATATTC CTTGCATAAC TATTACGCGT CAATATCTGA ATTACATCAC	6780
	CGCCAGTTTG TGGTGGCTTA ACTTCCAAGA ACCAACCTGC ATCACGCCAT TCTCTGGTA	6840
	ATGGGAAATC ATCGATTGTA ACTGTATGAT CAGTGTATAA ATAGTAAAGA CCTGGCTCTG	6900
30	TTAACATCCC AAGATTCTTA AGTTTATCAG GCCTCATTGG TAAAGGTTTA ACTCTACCAC	6960
	CTGTGTCAT CaTGATAAAA GGAACGCCCTC TTGAGTGAAG TATTTCTAAA ATACCTCTTT	7020
	GCCCAATCAT GAAAATACGA TGTGTTCTAT TTCCaTCACC ACCGACAGTA ACACCTAGCA	7080
35	TCAAAGCTTT TTTACCACTA TCTTTGTCAT AGTATATTTG CAAACCTTtC TgCTTCCGCA	7140
	AATTCGCCAG GAAATGAATC tAgTGTTCa CCATAGTCAG CATTAACTG ATACGCTTCT	7200
	TCTCCTGTTT CTAAATCGAA AGCCGTTAAA TAGTTTCTAT TATTTGGATT ACTGTCTCCT	7260
40	GTATACCAAT ACAAGTATTT TTCATCAAAA GTCACACCCT GCATTGGTTG GGTTTCGTTT	7320
	GTTAGTCTCA TAGGGTACT GATTTTATGC AAAACTTTAT CAATATTTTT ATCAACATCG	7380
45	TCTAACTTC TTATCTCTAT ATAAhTCATT GAGTTTTCAA GTTCCCACTG ACTTCTAGGT	7440
	CTCTCaATTG TGTATAGAAT TTTATTTTCT TTTTCATTa TGACAGGGGT GATGTAGGT	7500
	TTTTCTGGGT GTCCTGTAAA TACATCTTGC ATACCATACT TGCCATAGCT AATTTCCACA	7560
50	TTAGGCGTAT ACTTGAAACG AACTAATGTA TTCTCATTAT TACCATTTAA GATAAACTA	7620
	TAAATCCATA ACTCATcATC AATATATCTA TAACCGTTAT GTGTACCATG ACCCCACCT	7680
55	ACAATCAATG AGCTGTCTAT AAATTGACCA TTAGGTCTTA GACGACTTAG CATATAGCCA	7740

ATTACTGCAT TTGTAAGAGG TGCAAGTTCT GTCACAAATA AAAATTCTTG CTTATCAGGT 7860
 TCAAAACGAT ACTCGATATC AAGAATTTCT TGTTTGGTCT TATTTAATTC TCTTATAGTT 7920
 5 TCCTCTTTAT TAATTTGAGT TTTGGTTTCC CAATCGTCTA AATGTTCTTT TAATGTGTCA 7980
 AAGGTTTCGC CGTTTACATT AACTCGAGCT TGAACAATCT CATTAGCACT GTTATTACGT 8040
 10 GGTGCCACAA CAAGTGC GTT AATTTGACTT TGTAAGATT TGTTTACTGC TGCTTGCGAT 8100
 CTACCATTAT AATAAATTG CTCAGCGAAG TGTTGAATTG TTTTAGCTyT CTGATGCAAC 8160
 TTAAACTCTG TTGTCAAGCC AAGCGCAAAT TGCTCTATTC TTTGTAAGTT TTGTATTTCC 8220
 15 TTAGCTCTAT AATCTCGACC TGCTAAAGCT CCCAAATCCT TTATTAAATA CAAATTTTCC 8280
 ATAATGCACC TTCCTTTCTA ATAAATAGC ACTGTACCAA GTTCCCACT ATCGTCAACT 8340
 GTTATTTTCC ACAATTTACC GTTTGGGGAT TTCTGTACAA TGCTATTTTG AATAATTgcC 8400
 20 TGctTCGCCT ATTTTTAAAT TATCTAATTT ATTTktATCA TTTACCGAAA TGATACCGTC 8460
 TTGAGGCAAT CCATCAATAn CACTACTGCC TGCATAAGGT ATCCCATTTA TAGCTTTCCA 8520
 25 ATGTGTAGCT GGAAAGTACT GTTTATCGT 8549

(2) INFORMATION FOR SEQ ID NO: 6:

(i) SEQUENCE CHARACTERISTICS:

30 (A) LENGTH: 3601 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

35 AGGCGTGTAG TGACTTACGG nTAGGAACT ATGTATCCGA ATGATTTATT GAGACCAAAA 60
 AGGCATTAAA GTCCATTGAA ATATChGGTA GCGmGTTGGT ACgtTGGACGT GGGGGCCCTA 120
 40 GATGTATGAG TCAACCATTa TTCAGAGAGG ACATTTAACG TAATAAATTA TAGAmACGAG 180
 GGTGAAAATA ATGACAGAAA TTCAAAAACC GTATGATTTA AAAGGCAGAT CATTATTAAA 240
 45 AGAAAGTGAT TTTACCAAAG CAGAATTCGA AGGACTTATT GATTTTGCAA TTACATTAAA 300
 AGAGTATAAG AAAAACGGTA TTAAGCATCA CTACTTATCT GGAAAAAATA TTGCACTACT 360
 ATTCGAAAAG AATTCGACGA GAACGCGTGC TGC GTTTACA GTTGCGTCTA TTGATTAGG 420
 50 TGCGCATCCA GAATTTTTAG GAAAAAATGA TATTCAATTA GGCAAAAAAG AATCTGTAGA 480
 GGATACTGCG AAAGTATTAG GTAGAATGTT CGATGGTATT GAATTCCTG GTTTTTCACA 540
 55 ACAAGCTGTT GAAGATTTAG CGAAGTTCTC TGGTGTACCG GTGTGGAATG GATTAAACAGA 600

EP 0 786 519 A2

	TCTAGAAGGA ATAAACTTAA CTTACGTTGG AGATGGACGT AATAATATTG CGCATTTCATT	720
	AATGGTAGCA GGTGCTATGT TAGGTGTAA TGTAAGAATT TGTACACCTA AATCATTAAA	780
5	TCCAAAAGAG GCATATGTTG ATATTGcAAA rGAAAAaGCG AGTCAaTATG GTGGTyCAGT	840
	CATGATTACG GATAATATTG CAGArCAGT TGAAAAaTwCm GATGCTATAT ATmCAGATGT	900
10	TTGGGTATCG ATGGGTGAAG AAAGTGAATT TGAACACGTA TTAATTTATT AAAAGACTAT	960
	CAAGTGAATC AACAGATGTT TGATTTAACA GGTAAGATT CAACGATATT CTTACATTGT	1020
	TTACCAGCAT TCCATGATAC AAATACACTT TATGGACAAG AAATTTATGA AAAATATGGA	1080
15	TTAGCTGAAA TGGAAGTTAC AGACCAAATC TTTAGAAGTG AACATTCAAA AGTGTtTGAT	1140
	CAAGCTGAAA ATAGAATGCA TACAATTAAG GCAGTAATGG CAGCAACATT GGGGAGTTAA	1200
	TCTACTAAATG GAACGATATG AATATGATGT GTCTGATGAT ATAAGTGTCA TGTACAGACA	1260
20	CCTCATATTG GTATTAAAGG AGAAATGAAT ATGAACGAAT CAGGAGATAA CAAACTCAGT	1320
	AAATCTTCTT TAATTGGACT AGTTATAGGA TCCATGATTG GTGGCGGTGC GTTCAATATA	1380
25	ATGTCTGATA TGGGCGGTAA AGCCGGTGGA TTAGCCATTA TTATTGGTTG GATTATTACA	1440
	GCTATAGGAA TGATTTTCATT AGCGTTCGTA TTTCAAAATT TAACCAATGA ACGGCCGGAG	1500
	CTAGACGGTG GTATTTATAG TTATGmTCAA GCAGGATTTG GCGATTTTGT AGGATTTATC	1560
30	AGTGmTTGGG GATATTGGTT CTCAGCGTTT TTAGGCAATG TTGCCTATGC AACACTATTG	1620
	ATGTCAGCAG TAGGTAACCT TTTCCCGATT TTTAAAGGAG GCAACACATT ACCAAGTGTT	1680
	ATTGTGCGCT CGTTACTACT CTGGGGTGTC CATTTCTTGA TTTTAAAAGG CGTTGAAACA	1740
35	GCAGCATTTA TCAATAGTAT TGTACTGTT GCAAAGTTAA TACCGATTTT ACTTGTAATC	1800
	ATATGCATGA TAATTGCATT CAATTTTGAC ACTTTTAAAA CAGGCTTTTT CAGTATGACG	1860
40	TCAGAGGGTG TATTGCCATT TAGTTGGGCG AGCACAATGA GCCaaGTtAA AAGTACGrTG	1920
	CTAGTGACAG TTTGGGTGTT TATCGGTATC GAAGGTGCAG TAATTTTTTC TAGTAGAGCT	1980
	nAAAATGAGA AAGATGTAGG TAGTGCCACG GTTATAGGAC TTATATCAGT TTTAATTATC	2040
45	TATyTCTTAT TAACTGTATT AGCTCAAGGC GTGATTTTGC AAAATCATAT TTCGCAATTA	2100
	GATTCGCCAA GTATGGCACA GGTGCTTGCA ACTATTGTAG GTGGTTGGGG ATCTACACTT	2160
	GTAAATATTG GTTTAATTAT TTCGGTACTA GGTGCATGGT TAGGATGGAC ACTGCTTGCT	2220
50	GGTGAATTAC CTTTCATTGT TGCAAAAGAT GGATTATTTT CAAAATGGTT TGCTAAAGAA	2280
	AATAAAATG GAGCACCTGT AAATGCACTG CTTATTACCA ATATATTAGT ACAATTATTT	2340
55	TTAATAAGTA TGCTATTTAC ACAGAGTGCG TATCAATTTG CATTTTCACT AGCATCAAGT	2400

CGACAGCAAG CAACTACTAA ACAATGGACG ATTGGTATCA TAGCCTCAAT TTATGCTATA 2520
 TGGCTTATAT ATGCAGCAGG TATCAATTAC TTATTATTGA CGATGTTACT TTATATTCCA 2580
 5 GCTCTTCTTG TTTATACaAT CGkTCmAAAAG rATWATCAGa CACGTTTGAT TAAATCAGrC 2640
 TATATTCTtTT TTATGATTAT tATCGTACTT GCAGTTATCG GGTTAATTAA GTTATTGATG 2700
 10 GGAACGATAA ATGTTTTTTA AAAGGAGCGA CAAAAATATG AAAGAGAAAA TTGTCATTGC 2760
 ATTAGGCGGT AATGCGATAC AGACAACAGA AGCAACAGCT GAAGCACAAC AAACAGCTAT 2820
 TAGATGTGCG ATGCAAAACC TTAAACCTTT ATTTGATTCA CCAGCGCGTA TTGTCATTTC 2880
 15 ACATGGTAAT GGTCCACAAA TTGGAAGTTT ATTAATCCAA CAAGCTAAAT CGAACAGTGA 2940
 CACAACGCCG GCAATGCCAT TGGATACTTG TGGTGCAATG TCACAGGGTA TGATAGGCTA 3000
 TTGGTTGGAA ACTGAAATCA ATCGCATTTT AACTGAAATG AATAGTGATA GAACTGTAGG 3060
 20 CACAATCGTT ACACGTGTGG AAGTAGATAA AGATGATCCA CGATTTGATa ACCCAACTAA 3120
 AcCAaTTGGT CCTTTTTATA CGAAAGAAGA AGTTGAAGAA TTACAAAAAG AACAGCCAGA 3180
 25 CTCAGTCTTT aAAGAAGATG CAGGACGTGG TTATAGAAAA GTAGTTGcGT CACCACTACC 3240
 TCaATCTATA CTAGAACACC AGTTAATTCG AACTTTAGCA GACGGTAAAA ATATTGTCAT 3300
 TGCATGCGGT GGTGGCGGTA TTCCAGTTAT AAAAAAGAA AATACCTATG AAGGTGTTGA 3360
 30 AGCGGTTATA GATAAAGATT TTGCTAGTGA GAAATTAGCA ACGCTGATTG AAGCAGATAC 3420
 CTTAATGATT CTTACGAATG TAGAAAATGT ATTTATTAAAC TTTAATGAAC CTAATCAACA 3480
 ACAAATCGAT GATATTGATG TAGCAACACT GAAAAAtAC GCGGCACAAG GTAAGTTTGT 3540
 35 GGAAGGATCG tGTTGCCAAA AATAGAAGCT GCGtACgtTT GTTGAAAGtG GGGaAACCA 3600
 A 3601

(2) INFORMATION FOR SEQ ID NO: 7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 573 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

50 CGACACTATT AAATGAATTA GAGCACAATC TAACAAATCA AATTCATTTT TCAAAAGATG 60
 AACGACTCAC ACATATCGCT TTAAAGTTAT TCGAAACAAC CGATCCTGTT TCAACAAAGC 120
 55 AACTTGCGCA AGATGTTAAT GTTTCGCGTC GGACAATTGC AGATGATATT AAAATGATTC 180

TTATTGGTGA GGAAGATCAT TATCGTAAAG CGTATGCACA CTTTATACAT CAATATATGA 300
 AACAGCTGC ACCTTTTATA GAGGCGGATA TCTTTAATTC AGAATCAATC GCATTGGTTC 360
 5 GCCGTGCCAT TATTAAGACA TTAAATAGTG AAAATTATCA TTTAGTTCAG TCGGCTATCG 420
 ATGGCTTAAT CTATCATATA CTCATTGCCA TTCAGCGTTT AAATGAAAAT TTTTCGTTCC 480
 ATATACCTAT CAATGAAATT GATAAATGGC GACATACTAA TCAGTATGCn ATTGCTTCAA 540
 10 AAATGATAGA AAACCTAGAA CGCAGTGTA TGT 573

(2) INFORMATION FOR SEQ ID NO: 8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1221 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

TTGATATTTA TAACGTTATA TTTTAATAGT TCACCTGGAT TATTAAATAA ATAGTCCGCC 60
 25 AAATTTTCTT TTTCTTTATC AATCTGaTg TAATTAACaC TTTCGaCTTC TGTAGGAATT 120
 CTAATGTCAA CAGAAGCATT GATATAAGCT TGATGTTGCA TGCAATCACA CTCCTAATCC 180
 30 TTCATmTmAA ACGGAGAAGT AAACCCGTCA CTATTCAAAT TCAATCCTTT TGCCCAATCA 240
 ACAGGCTTAT TCATGATAGT TTCGATTTCC TTAAGTCCAT TTGAACCTCT AGGTATTTCT 300
 ACAATTACTT CATCATGGAC ATGGCCAACT ATTTTAAAC CTAATGCTTC AAGCCTTGCT 360
 35 ATAGAAATCG CAAGTAAATC CCTTGCAGTT GCTTGAACAA TATTCTCGAC TAACCTCCCA 420
 CCATACGTTT TTAACCTTGA CCATTTACGG TTAAGATCTA ACCCCATAAA TTCAACAAC 480
 TGACTACCCC AACTATTTTC ACCAACTAAA GCTTTTGGAT AAGCTAAAGC TCTTCCACTA 540
 40 GGCAGTTCAA TCATTAGAAA ACCTTTTTTC ATATAAAATC TAAGTCCATG TGTATGATGC 600
 GTCTTTCGGG ATTTTACAGT ATTAATTGCA GCCTCTTGGC AAGCCTTCCA AAAATTAACT 660
 ATGTTAGGAT TTGCGTTACG CCAACTATCA ACTAAACCTT GTAACCTGTT TTCTTCAATG 720
 45 CCCATTCCA ATGCACCCAT TGCTTTTAAA GCTCCAGCGC CACCTTGATA GCCTAAAGCT 780
 AATTCGGACA CTTTTCCTTT TTGTCTGAGA GGGTCGCCTT TAGTTATGCT TTCTACCGGT 840
 50 ACATTAAACA TTTGAGAAGC CGATGCTTCA TATATCTTTC CGTGTGTGTT GAATACATCT 900
 AAACGCCATT GTTCTTTTGC ATACCATGCT ATGACTCTTG CCTCTATTGC AGAAAAATCA 960
 CTTACTGCTA GTTCATTACC TTCTTCAGCA GTAAATGTCG TCCTAACTAA TTGACTTAAT 1020

AGATCTCTTG CTATTTCTAA TTCAGTATCT GAAATATAAT GCTTTGTTAA ATTCTGAAGT 1140
 TGTACACCTC TACCTGCCCA TCTTCCAGTA CCGGCACCGT AAAATTGAAA CAGACCTCTT 1200
 5 ACCCGTTCAT CACTGCACAT C 1221

(2) INFORMATION FOR SEQ ID NO: 9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1090 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

TTTTGTTTGG TATGAGGTAG CAATGACGAC GTGTCATTGG TGGAGATTGT AAAAATACAT 60
 20 AATAAAAAGA AGCGGCAATG TATACCGCTC CTTTTTTATA CTACATACCG ATTTTCAACC 120
 ATCTCTTTCT ACTTAGTAAT AAGACAATAG TATTA ACTAT AAATAGAAGA ACGAAGAATG 180
 ATACTATATT TATAATTTCA GTAGGACACA TAAATGTTGA CTCGTTATTC AATATTTTTT 240
 25 CTACGGCAGC ATACATCGTA TTGCTCGCCT CAAATGGAGC AACGATACCA AATATATTTT 300
 TATTAATGGC AACTAAGATG ACTGAACCAA TCCAATATAC AATGCTGATA CCTAAGCTGA 360
 30 TTAAATGTT AGGTGAAACC ATACTAATCG TTCCAACAAC TAAGATATAT TGTAAGATAA 420
 CGAGTGAAAA TAAGATTATT AATAGTAAGT AATGTGAGAA ATCCGAATAT ATAATTGAAA 480
 TAATAGTGAT ACTTAGAATT ATGAACACTA AACATTCAAA AAATAACACT GCTACCTTTT 540
 35 TATAGAAGAA GGTAAAGATA TTATCGCCAA TCAATTTATA AAACAGGATA TTTTATTTCG 600
 AATACTCTTT ATTAATAAAA TATGCAATAA CAAATGAAAA TAGTAAGAAC CCTAATTGCG 660
 TTGCAACAGT ATATGAACTG AAGAAAAACT GGCTATAGCT TAAACTTTTA ACTTTGTCTA 720
 40 TACCTATTGG TAAAAAATAC CCAAGTAAGA AAAGGAATGT GAATAGCACA ACAAGCGTGT 780
 AAATAATTTT ATTGGAAATA CTTTTTTTAA ATTCTAATTT CAAAGTGGAC ACCTCAATTA 840
 TAAATTAATG TAATCATTTA TGA CTCTTCTC TTTTGATTGG TACTCTTCTA TTTGAAGGTC 900
 45 TTTAAAAATA AAGTATTTTAC CCGGCAAAGC ACTTAAATCG GATAAAATTaT GTGTAATATT 960
 GATAATAGTT TTAGTTTGAT GGCTTTGAAT AAAATCATTT AAAAATTCAT AAATTTTCATT 1020
 50 AACTGTTTTT TGTCTAAAG CGTTTGTAAC TTCATCTAAT ATGATTAAAT CATGATCTTC 1080
 CAATAAGAAA 1090

(2) INFORMATION FOR SEQ ID NO: 10:

- (A) LENGTH: 904 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

10	TTAGGACTAT TTTATCATAT TCATTTAAAT TACGGCTAAA AATTTTAAAA ACGGGGATTA	60
	ATATATGGAA TTAAGCTATG AAAGTTAATT GATACTTGCA TTTTACGCTG ATTTATATAA	120
	GAATAACTAT TGTATAGTTT TAAAAACGAA CGTACGTTTG CAGGAGGCGA AATCATTGGC	180
15	AATGAATAAA CAAAATAATT ATTCAGATGA TTCAATACAG GTTTTAGAGG GGTTAGAAGC	240
	AGTTCGTAAA AGACCTGGTA TGTATATTGG ATCAACTGAT AAACGGGGAT TACATCATCT	300
	AGTATATGAA ATTGTCGATA ACTCCGTCGA TGAAGTATTG AATGGTTACG GTAACGAAAT	360
20	AGATGTAACA ATTAATAAAG ATGGTAGTAT TTCTATAGAA GATAATGGAC GTGGTATGCC	420
	AACAGGTATA CATAAATCAG GTAAACCGAC AGTCGAAGTT ATCTTTACTG TTTTACATGC	480
25	AGGAGGTAAA TTTGGACAAG GCGGCTATAA AACTTCAGGT GGTCTTCACG GTGTTGGTGC	540
	TTCAGTTGTA AATGCATTGA GTGAATGGCT TGAAGTTGAA ATCCATCGAG ATGGTAATAT	600
	ATATCATCAA AGTTTTAAAA ACGGTGGTTC GCCATCTTCT GGTTTAGTGA AAAAAGGTAA	660
30	AACTAAGAAA ACAGGTACCA AAGTAACATT TAAACCTGAT GACACAATTT TTAAAGCATC	720
	TACATCATTT AATTTTGATG TTTTAAGTGA ACGACTACAA GAGTCTGCGT TCTTATTGAA	780
	AAATTTAAAA ATAACGCTTA ATGATTTACG CnwGGgTAAA GAGCGTCAAG AGCATTACCA	840
35	TTATGAAGAA GGGATCaAAG rGTTgTTAGT atGTCCAaTG ArGGAAAAGA AGTTTTGCCT	900
	GACG	904

(2) INFORMATION FOR SEQ ID NO: 11:

40

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 11271 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

45

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

50

50	GATTTCTAAA TCAAGATCTG TTTTACGATA ACCATTCAAA CCTTGACGTT CATCTTCTTC	60
	AGGTTGATTT TGTTGCTGTG TGTCTTTGTT GTCAGAAGTC GCTACTGTTT TTTTATTATC	120
55	TGTTTCTTTA GTCATAACAA ACGCCTCCGT TATAAAACGC TATATTTAAT GATATGTGAT	180

EP 0 786 519 A2

	TTAATAAGAC GATTCAGCAA GTTTTAAAGT ATTATTTGAC TATGTTGGAT TAGGCATCTA	300
	GTCTATAAT ATCACTGACA TTGTCAAAAT GATGATCTTT TAAGTAACGT GCGATGCCTT	360
5	TGTTCAATTTT CTTAGTTAAA CCTGGGCCTT CAATAACAAG TGATGAATAA ATTTGAATAA	420
	GTGACGCACC GTGACGCATC ATTTTGATTG CATCTTCAGT ACTGAATACG CCGCCTGTAC	480
10	CTATAATTAA AAATTACCA TTTGTTTGCT GATAAgCATA CTTAATCAAT TTTAAATTAC	540
	GTTCAAATAA TGGACGACCA CTCAAACCGC CTTCTTCGAC TTTATTAGCA GAAGTTAAAC	600
	CATCTCGTTG TCGCGTTGTG TTTGCTAAGA TGATACCGTC AAATGTCTCA GTAATCGCTG	660
15	GTAATAGTGC TTTTAAGCCA TCGAAATCCA TATCAGACGT TAGTTTTAAA TAAATTGGCA	720
	CTGTTACATC ATGTTGTTTT TTAAATGCTG TTAAAGCTTG GCATAACATT GAAAATTCAT	780
	CTTATCATG GAAGTTTTGA AGATTTTCAG TATTTGGAGA ACTGATGTTG ACTGTGAAAA	840
20	ATGAAACGTC GTGTTTAAAC GTATCAATAA CCTTTATATA ATCTTGATAA CGCGCTTCAT	900
	AAGGTGTCAT TTTATTCACA CCAACATTGA TACCAACAGG TACTTGATAA GCATTTTTAC	960
	GCAAATGACT TAGTGCTTTG TTCATACCAA TATTATTGAA GCCCATTCCA TTTATCAAGG	1020
25	CGTCATCTTC TAATAATCTA AACATGCGTG GTTGAGGGTT ACCCGGTTGA GGTTTAGGTG	1080
	TGATACCACC TAATTCTAAA GCACCGAATC CAAGGTGTTT CAATGCTTTT GGTACTTCGC	1140
30	AAGATTTGTC GAAACCAGCT GCTAAgCCAA TTGGATTGTC GTACGTATTA CCTTGTATCG	1200
	TTTGTGATAA CGTTGGATTG TTATAAGTAA ATAGTTTATC GACGACTGGG AATAAAACCG	1260
	GaAACTTTTG TaACGTTTTT AATGCATCGA TAGTTAGTCC GTGTGCTTTT TCGGGTTCCA	1320
35	TTTTGAATAA GAAAGGTTTA ATTAATTTGT ACATGAGTAT GCTCCTATTT CATTATATTT	1380
	GAGGCTTACT ATCCTCAACT TAATATATGT GAAATATATT CTTTTAATAG ACTAGCATTT	1440
	CCATACATAA TTTCCTAGTT AAAACTAAAA AGTTTTGAAA ATTGACGCAA gTTTGAATAA	1500
40	CGTTTTTAAG ATTAAATCAT CCTAATTAGG CAATATTATA GTATAAAGTA AGTAGATTGG	1560
	AAGGTGTTTG TATGAATGAA CAATGGTTAG AGCATTTACC TTTAAAAGAT ATTAAGAGA	1620
45	TTTCACCACT GAGTGGTGGT GATGTAAACG AAGCATATCG AGTCGAAACA GATACGGATA	1680
	CATTTTTCTT ACTTGTCCAA CGTGGACGTA AAGAATCATT TTATGCTGCA GAAATTGCAG	1740
	GTTTAAATGA ATTTGAACGT GCAGGTATCA CGGCACCTAG AGTAATTGCA AGTGGCGAGG	1800
50	TTAACGGTGA TGCGTATTTA GTGATGACGT ATTTAGAAGA AGGGGCTTCA GGGAGTCAAC	1860
	GCCAATTAGG GCAACTCGTA GCTCAATTAC ACAGTCAGCA ACAAGAAGAA GGCAAATTTG	1920
55	GCTTCTCATT ACCTTATGAA GGTGGCGATA TTTCTTTTGA TAATCATTTG CAAGACGATT	1980

EP 0 786 519 A2

	GGCTATGGGA TGCCAACGAT ATCAAAGTAT ATGACAAAGT GCGACGTCAA ATTGTGGCGG	2100
	AATTAGAAAA GCATCAAAGT AAACCGTCTT TATTACATGG TGACCTATGG GGTGGTAATT	2160
5	ATATGTTCTT ACAAGATGGT CGTCCGGCGT TATTTGATCC AGCGCCATTA TATGGTGACA	2220
	GAGAATTCGA TATCGGTATT ACAACGGTAT TTGGTGTTTT TACGAGCGAA TTTTATGATG	2280
10	CGTATAATAA ACATTATCCA CTCGCAAAAG GTGCATCCTA TAGACTTGAA TTTTATCGTT	2340
	TATATTTATT GATGGTCCAT TTATTGAAAT TTGGTGAGAT GTACCGTGAT AGTGTTGCGC	2400
	ATTCTATGGA TAAGATTTTA CAAGATACAA CAAGTTAGTT AAGACGTTAG ATTGAGATAA	2460
15	ATAGATAATA TGCACAGATA TTTTACAAT GAGAAGCGAT ACAGCTGCCT CAATAAAAAAT	2520
	ATTTGTGCGT TTTTATTGTT GGAAAAATAA ATTTTAATCG CTATTGTTAA TTTCTGTAAT	2580
	GTAAAAACAAG GTTGAGTTAC AATAAAAGTG ATTTTATAAC TTTTGTTC AATAAAATTCT	2640
20	AGGAATGATA CATATTTATT GATACAATAA TTTTGAATAT AATCATAAAA CAATATTTAA	2700
	GTATAATTGA ATGTTTGAAT ATCATATATT GATACAGTTT CTAATAATTT TAAAATAATT	2760
	TAAATGGAGA GAGGTGTAAA TGATGAGTAC AGTTCAAAGT GATATTTTTA AGACCAATAG	2820
25	TGCATCATCA TCTATTAAAA GCGCTGTTGA AACATGTAAT AATGTGTCGA AACCGGATAA	2880
	AGATGAAAGT ACAACAGTAA GTGGAAATAA TAATGCTCAT AGTGATAG ATGATTTGAT	2940
30	GAGTAAGAAT CAATCTGTTG CTGAAGCAAT ACGAACTGCG AGCGATAATA TACAAAAAGT	3000
	TGGTGAGGCT TTTGACCAA CTGACGTAAT GATTGGTAAT GAAATTGGTA AAAATTAAAA	3060
	CGTGGTGAAA TGATGTCGAA TAAACTGGAT GAAATCAATA AAATAATCAC AGCGAAACAT	3120
35	GAGCAAATGG ATGACTTATA TGATGAAAAG CGAGAGGTTA AAGCATTGAT AGATGAAAGT	3180
	GATGCGCTTA ATCATTCGAT AGATCAATTA TATCAACATT TAGGTGAGCG TTATTATAGT	3240
	AGCAATATGG CTAGTCGTAT GGAACAGTTC CGCGATGAAT TTCATTTTGC GAAACGACGT	3300
40	TCAACGGAAG CGTTATACGA GCAGCAACAG CAAATTCAAC ATGGCATTCTG TAAAGTGGAA	3360
	GAAGAGATGA TTGACTTGGA AATGCGAAGG AATGTTGAAA TTGAGACGGT GACAAAGGAG	3420
	GAAAATAAAT GGAAACAATA GGAAGCATT TTTATTTAAA AGAAGGTTCTG CAAAAGTTAA	3480
45	TGATTATTAA TAGAGGmCCA aTTGTAGAAA TTGAAAATCA AAAGTATATG TTTGACTATT	3540
	CTGCATGTAA ATATCCGATT GGTGTTGTAG AAGATGAAAT TTATTATTTT AACGAGGAAA	3600
50	ATATAGATTC AGTTATTTTT AAAGGTTATT CTGATCAAGA TGAGGTTAGA TTTCAAGACT	3660
	TGTTTGAAAA TATGAAACAA AATTTGGATA GTGAAATACA ACGTGGAGAA GTTACACAAC	3720
55	AATAAAGAAA TACTTTTTCT TTATTGGGGT GGGACGACGA AATAAATTTT GTAAAAATAT	3780

EP 0 786 519 A2

	ATGTCATTCA TAATCATTTG AACTAAACGT AGCAGCCTTA AATTTTAAAA AAAGACACAT	3900
	ACCAACTTCC GAAATGTAGA TGAATTCTCT ACAATAACGG AAGTTTTTCT TTTAATATTG	3960
5	AAATTTCTCA AGGATAGGTC TATACTTTAT AAATCGTAAT TATTACGATT TATAATCAAA	4020
	AACAATAACT TGAAATAGAT CATTGAGGGA GTGTTAATAT GCAACATCAT AAAGTGGCTA	4080
10	TTATcGGTGC CGGTGCTGCA GGTATAGGTA TGGCCATTAC CTAAAAAGAT TTCGGTATAA	4140
	CAGATGTCAT TATTTTAGAA AAAGGAACAG TAGGACATTC ATTTAAACAT TGGCCGAAAT	4200
	CGACCCGTAC GATCACGCCA TCATTTACGT CTAATGGATT TGGCATGCCT GATATGAATG	4260
15	CAATTTCCAT GGATACTTCA CCAGCATTTA CATTTAATGA AGAACATATT TCCGGAGAAA	4320
	CATATGCTGA ATATTTACAA GTGGTTGCCA ACCATTACGA GCTGAATATC TTTGAAAATA	4380
	CAGTTGTCAC AAATATATCT GTAGATGATG CATATTATAC GATTGCAACG ACAACAGAGA	4440
20	TATATCACGC GGATTATATC TTTGTCGCAA CAGGTGATTA TAATTTCCCT AAAAAGCCAT	4500
	TTAAATATGG TATTCATTAT AGTGAAATTG AAGACTTTGA TAACTTTAAT AAGGGGCaAT	4560
	ATGTGGTTAT CGGAGGTAAT GAAAGTGGCT TTGATGCTGC ATATCAACTT GCAAAAAATG	4620
25	GCTCTGACAT CGCACTTTAT ACTAGCACAA CCGGTTTAAA TGATCCGGAT GCTGATCCTA	4680
	GTGTTAGATT GTCACCTTAT ACACGTCAGC GACTAGGTAA TGTCATTAAG CAAGGTGCTC	4740
30	GCATCGAAAT GAATGTACAT TATACAGTTA AAGATATTGA TTTTAACAAT GGACAGTATC	4800
	ATATCAGTTT TGATAGCGGA CAAAGTGTGC TTACACCTCA TGAACCAATA CTAGCAACTG	4860
	GCTTTGATGC AACAAAAAAT CCAATCGTTC AACAAATTAT TGTGACAACA AATCAAGATA	4920
35	TTAAATTAAC AACACATGAT GAATCGACAC GTTATCCGAA TATTTTTATG ATTGGTGCAA	4980
	CAGTTGAAAA TGATAATGCC AAATTATGCT ATATCTATAA ATTTAGAGCG CGATTTGCAG	5040
	TACTTGCACA TCTTTTAACA CAGCGGGAAG GcTTACCAGC TAAACAAGAT GTCATTGAAA	5100
40	ATTATCAAAA AAATCAAATG TATTTAGATG ATTATTATG TTGTGAAGTG TCATGCACAT	5160
	GTTAGAAGTG AAATATGATA TGAGAACTGG GCATTATACG CCCATACCTA ATGAACCTCA	5220
45	TTATTTGGTT ATTAGTCATG CGGATAAACT TACCGCAACA GAAAAAGCGA AATTAAGATT	5280
	ATTAATCATA AAACAGAAAT TAGATATTTT ATTGGCAGAA AGTGTAGTTT CTTcGCCTAT	5340
	AGCGAGTGAA CATGTGATAG AACAAATGAC ACTATTTCAA CATGAGCGAC GACATTTAAG	5400
50	ACCTAAAATA AGTGCGACAT TTTAGCCTG GTTGTTGATA TTTTAAATGT TTGCATTGCC	5460
	AATCGGTATC GCTTATCAAT TTTAGATTG GTTTCAAAAT CAGTATGTGT CAGCATGGAT	5520
	AGAATATTTA ACTCAAACAA CATTGCTCAA TCACGATATA TTACAGCATA TATTATTTGG	5580

55

	ATTGATTAGT TTATCAACTG CTATAATTGA TCAAACAGGA CTCAAATCAT GGATGATATG	5700
	GGCAATTGAA CCGTCAATGT TATGGATAGG ATTACAAGGT AATGATATCG TGCCACTATT	5760
5	AGAAGGGTTT GGATGTAATG CAGCAGCTAT TTCACAAGCA GCACACCAAT GCCATACCTG	5820
	CACGAAGACA CAGTGTATGA GTTTAATAAG CTTTGGTAGT TCTTGTAGTT ATCAAATAGG	5880
10	TGCGACATTA TCTATTTTGA GTGTAGCTGG AAAGTCATGG CTATTTATGC CGTACTTAAT	5940
	ATTAGTACTT TTAGGTGGCA TCTTACATAA AGGATATGGT TGAAAAGAA TGATCAACAA	6000
	CTTAGCGTTC CGCTACCTTA TGATAGGCAA TTACATATGC CAAATATACG TCAAATGTTG	6060
15	CTACAAATGT GGCAAAATAT ACAAATGTTT ATCGTTCAAG CGCTACCTAT TTTTATCACA	6120
	ATCTGTCTTA TTGTTAGTAT TTTATCACTA ACGCCAATTT TGAATGTTTT ATCACAAATA	6180
	TTTACACCTA TATTATCGTT ATTAGGCATC TCGTCAGAAT TGTCAACCAGG GATTTTATTT	6240
20	TCAATGATTC GAAAAGACGG CATGCTCTTG TTTAATTTGC ATCAGGGCGC CTTATTACAA	6300
	GGAATGACAG CAACACAGTT ACTACTACTT GTGTTTTTTA GTTCAACATT TACAGCGTGC	6360
25	TCGGTCACAA TGACGATGCT TTTGAAACAT TTAGGTGGTC AGTCAGCACT AAAATTAATT	6420
	GGAAAGCAAA TGGTGACATC ATTGTCTTTA GTTATTGGTG TAGGCATCAT TGTTAAATA	6480
	GTAATGCTGA TTATTTAAAA AAAATGAACT ATAAGTGAAT ATAGAGTCAT GTCAGTCAAT	6540
30	AGGAGATCTA TCTTGGGAATA TGCTATTTCAT ATGAAGTATA AGAGGAGAGT CGCAGATGAA	6600
	AATAGTTATT ATAGGTGGGT TTTTAGGTGG CGGTAAACG ACTGTCTTAA ATCATTTGCT	6660
	CGCTGAATCA TTAAAGGAAT CGCTGAAACC AGCAGTCATC ATGAATGAAT TTGGGAAAAT	6720
35	GAGTGTGAT GGTGCCTTAG TATCTGAAGA CATACCTTTA AGTGAAGTGA CAGAGGGGTG	6780
	TATCTGTTGT GCAATGAAAG CAGATGTATC AGAACAGTTA CATCAATTAT ATTTAAAAGA	6840
	GCAAACAGAC ATTGTATTTA TTGAATGTAG TGGGATTGCA GAACCGGTCT CTGTCTTAGA	6900
40	TGCTTGTTTA ACGCCTATTT TAGCTCCGTT TACAACAATT ACACATATGA TTGGTGTAAT	6960
	AGACGCAAGC ATGTATAAAC ACATTAAATC ATTCCCTAAA GACATCCAAG GCTTATTTTA	7020
45	TGAGCAATTA GCATATTGTT CTGTCTTATT TGTTAATAAA ATAGATTTCAG CAGATGTTGA	7080
	AACAACGAGC AACTATTGA AAGATTAGA AGTTATTAAC CCAGAGGCCG ATATACAAGT	7140
	CGGTATGCAT GGCAGCGTCA CTTTGCCAAT ATCAGTTAGA CAAATGACAG CAACTTCTGA	7200
50	CAATAAACAT AAGTCTTTAC ATCAAATGAT TAATCATCAA TTTGTGCAAT CACCAGTCAA	7260
	ATGTACTAAA GCAGAGTTTA TAAACGTTT AGCATGCCTT CCGTCTCATA TTTATAGGTT	7320
55	GAAAGGGTTT ATGACATTTG AAGACACCGC ACATACGTAT CTCATTCAAT TTACACAAGG	7380

EP 0 786 519 A2

	CGGAAAGGGT ATTTCAAAAG AAGACTATCA ATGTTTGGAA CAGTAGTGTT TTCAGTGGAA	7500
	GAGAATGGTT AACATGCCTT CATGTATAAT AACGAGTTGA TTTGAACGTT TAAGCGTAAA	7560
5	TAAAAATAAG CTTGGTCAGC CATCAAATAT AATTTGAAAA CTGTCCAAGC TGTTTTATTA	7620
	GAGAACAATC AATTAACCCC ACATATTTAA TAATACATCA GCAAAGCCTT CAGGTTTTTG	7680
	AATATAACCT AAGTGACCGC CTGGAATATC TACAATAGGT ATGCCAGTTT CTTTATTTAT	7740
10	ATAAAAGTTA ACATCTTG TG GGAAGGAGCC TCTAGAATCT GTCCCATTTA GTAGGGTGAT	7800
	TTTATCGCTG TATTTTGTGA AATCATCCAA AGTAATATCT GAATGCGTAT ATTGTCTAAT	7860
	TTCAAATTCT GACCAGAACA TCGTACGTTT GACTGTGTTCT ATACGTCCTT CTTCAGTATC	7920
15	AGCAGGTTGA GACATCATTT TTGCATCAAT TGGTGCGATA TTAAATGTTT CGCCAAATGT	7980
	TTTCATGCCT TTTTCTAAGC CTTCTGTTAA AATTTGATGC ACAATGTCAT CATTTTTATC	8040
20	TTTCCAATAA GTACTGTCTG GTAAAAATGT ATTAATTGGT GGTTCTGTGA ATGCAATCTT	8100
	TTTAACGACT TCAGGGTAAT CTTTAAACAC ATGCATCGCA ACGATTGAAC CTGAACTTGA	8160
	ACCTAATATA TAGACAGGTT CATCACTTAA TGACTTTGCA AGTTCGGCAA TGTCTGTGC	8220
25	GTCGCGTTTG ACACGATAAT CACTGTCAGG GTTTGAAGCG GAATCAGGGA GTGGTTCAGT	8280
	TAACTCGCTT TCTCCATAAT CACGACGATC AACGGCTACA ACAGTAAAAT GGTCTTTTAA	8340
	CTGTCTGCA AGAGGCAGAA AAATGTCTCC GGTACCGTTT GCACCAGGAA TAAAGATGAG	8400
30	CACGGGTCCT TGTCCGACTT GGTGGTATCG TAATTTAGCG CCTTGTAATT CTAAAGTTTC	8460
	CATATTCAAT GACCTCCATT TGTTAATTGT TAGGTGATAA ACCTAATAAT TTAGCACCAT	8520
35	TTGTATAACT TATTTTCTCT TTTCTTTCAT CTGTTAAACC CAGTTCATCT AAAAATACAC	8580
	CTAATTTTTC AGGCTCAATA TATGGATAAT CAGCAGCATA AAGAATTCTA TCAATACCTA	8640
	CTTCTTTCTT GACTAAATCA AACTGTGGCT TCGTTAACAT GCCACTCGGT GTGATATAAA	8700
40	AATTATTTTT AAAGTAATAG CTTACAGGGT GGTTCAAATG TTCAGCGAAT AAAGCTTCAT	8760
	CCATACGTTT TAAGAAGAAT GGGATAAACT CACCCCAATG TCCAATAATC ATATTTAACT	8820
	TTGGATAACG ATCAAAAATA CCAGATAATA CTAGATGTAT TGTATGAATG CCGACATCAA	8880
45	TGTGCCAACC ATAACCAAAA CAAGCAAATG TTGCCGCAGT TACTTCAGGA TAATTTCTTT	8940
	TATAGTATGA TTGATAAATG TCACTGTTAA CTGGCGCGGG ATGTAGATAA ATCGGTACGT	9000
50	CTAAATTTTC AGCTGTTTTG AAAATAATGT CATATTTGTC TTGATCAAGA AAACCATCTT	9060
	GTGCACGTCC CATAATGAGC GCACCTTTGA ATCCTAAATC ATTGATGCAA CGTTCGAATT	9120
	CTCGCGCTGC GGCTTCAGGC TCATTGATAG GTAAAGTTGC AAAGCCTACA AAGCGATTGG	9180

55

TCTGACCAAC CAAATTTGAA GGAGAACCAT TTCCATAAGA TAAGACTTGA ATTTGAACGT 9300
 CTTGATTATT CATAAATTGG ATACGTTTCA CATGATGTGA TAATTCGTCG GCATTTGTAA 9360
 5 AACCTGTCTT TTTTTCaAGG CCTTCTAACA TTACTTTCAT CGGTACACCT TTAGGATCTG 9420
 CTGATATCGC ATTCATCGTT TCTTTTTGAA TATCTTCAAT GACATAATGT TCTTCAAACG 9480
 10 TAATACTTTT CATTTACTTC GCCTCCATAT TGTATTGCAT GTTTATTGCA TCTATTGCAG 9540
 AAGCATTTTT TATATACCTC TAATTTCAAT GTTTGTAACA TAAAATTGAT CTACCAAGGC 9600
 ATCTCTCCAT CGCCATTAAT AAATGTACCT GTTGGGCCAT CTGCACCAAT CGTTGCTAAT 9660
 15 TGAATGATTG GCTTGATTCC TTCAGAAACG TGTTTGAAT TATTACTAAA ATCACCACCT 9720
 AAATCAGTAT TTGTAGCGCC TGGATCAGCA GCATTGATTT GCATGTTAGG TAATCCTTTA 9780
 GCGTATTGTA GCGTTAGCAT TGTACTGCC GATTTAGACG AACAATAAGC TAATGAATTC 9840
 20 ACTTTAGATT CAGCTGTTTC GGGGTTTGTA ACCATTCCAA ATGAACCTAA ACCACTTGAT 9900
 ACGTTGACGA CAACAGGTTG TTCAGATTTT TCTAAGAGAG GGACGAATGT ATTCATCATT 9960
 CGTACGATAC CGAATACATT CGTTTGATAT ACTTCTTCAA CGTCACGAGG TGTCAATTTG 10020
 25 GAAGGTGCTG AAAATTGACC AGATATACCT GCATTGTAA TGAGGATATC AAGACGGCCT 10080
 TCTTTTTCAG CAATCATGTT ATAAGCATTT TTAGTGTAGT AGTCACTTGT AACATCTAAT 10140
 30 TGTACATAAT GAACACCTAA TTTTGTGAT GCTTGTGTGTC CTCTTACATC ATTCCGAGAA 10200
 CCTATATAAA CTTTGTAACC CAATGCTTTA AGTGCCTCTG CACTTGCATA GCCTAACCT 10260
 TTATTGCCTC CTGTGATTAA CACAATTTTA GTCATTACGT CCCACCTCAT CTAAATAAAT 10320
 35 GTTTAATAAA TAATTTCTGT ACGCTTCAAT TGAAATATGG CGATGCTCTA TTTGGAAGGC 10380
 AAATACACTA GTTGATAATG ATTGCAACAG CATATCTGTT TTGAATTCGT GTAAGTGTG 10440
 TCATGCTTTT TAAATAAGTC ATAATAAAAA TCAAATAATT CTTGATAAAA TGCGCTTTGG 10500
 40 TAAAAACGTA ATTTATTGTT GCCTGCTTCA ATACATTGCA GTAGTGCCTT ATTATCGATT 10560
 TTAAATTGTA AAAGATAATC TAACGACACT TGCATAACCT CATAATTAGA ATGATAGTCA 10620
 TCTTTAATTT GCTTAAATG AGTGATAAAA ATATCAAGGT CTCTTTGTAT GACGTAGTAG 10680
 45 CATAAATCGC TTTTATCTTT GAAATGTGCA TACAATGTCC CCATACCGAT ACCTAGTTCT 10740
 TTAGCAATAC GATTCATACT AATGTTTTCA ACGCCTTCTT CATCAAAAAG TTTGTGCGCT 10800
 50 ATTTCTTCAA TTCGTTGCCT ATTCTCTTTT GCATCTTTTC GCATGATTAC ACCTACTTAA 10860
 AATTCTCTAA AATTGACAAA CGGATAACTC TCCGTTTATT ATAAAACGTG TTAAGAAAGT 10920
 TAGCAATGAA TTGCAATAA CTATTAAATA TCATAAAAGA AAAGAGTGTT GATAATGTCT 10980

55

ACCTTATCGG TTCAAATGAT TGCTGAAAAA CTGAATGTCA CTACAGAAGA TGTGGAAAAA 11100
 GTATTAGCTA TGACAGCGCC ACTAGGCATT TTTAGTCATC AATTACAACG ATTTATTTCAT 11160
 5 TTAGTATGGG ATGTCAGAGA TGTAATAAAC GACAATATTA AAGGAAATGG ACAAACACCA 11220
 GAACCATATA CGTATTTAAA AGGTGAAAAA GAGGACTATT GGTTTTTAAG A 11271

(2) INFORMATION FOR SEQ ID NO: 12:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6261 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 15 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

20 CAACCCGTTT AGAACAAAAT AAAAACCGTA CAATTTTATC ATCTTAATGA TTATTGTACG 60
 GAAAACTTT TTTACATCAT ATCTGCATGT GCATAATCGA TATCGGTAAA TTTATTATAT 120
 TGTTTCATAA AATGTAACCT AACTGTGCCT GTTGGACCGT TACGTTGCTT AGCAATGATA 180
 25 ATTTCAATTT CACCGTTTTT ATCATTCGTT TGTGGCTCGA AACCACCATC ATCGTCATCA 240
 TCTTCATCGC CGCCACGGTT ATAGTAATCA TCACGGTATA AGAATGCAAC GATATCGGCA 300
 TCTTGCTCAA TCGAACCGA TTCACGAATA TCACTCATCA TTGGACGTTT ATCTTGTCGT 360
 30 TGTTCAACAC CACGAGATAA CTGACTTAAT GCGATAACTG GACATTTTAA TTCACGGGCT 420
 AATGCTTTTA ATGTACGAGA GATTTTCAGAA ACTTCCTGTT GTCTGTTATC GGACGCACGT 480
 35 GAACCACTAC CTTGAATCAA CTGTAAGTAG TCAATCACA TCATGTCTAA GCCATGTTCT 540
 TGCTTTAATC GACGACATTT AGAACGTAAA TCATTAATTC GAATACCCGG TGTATCATCA 600
 ATAAAAATCT TCGTACGTGA TAATTTACCT ACCGCTATAG TAAAACGACT CCAATCTTCC 660
 40 TCAGTCATAG TACCCGTTCT TAAGCGGTTT GAGTCAACAT TTCCAGAACT ACAAATCATA 720
 CGTGTGGCTA ACTGATCAGC ACCCATCTCT AGCGAGAAAA TACCAACTGT ATACATATCT 780
 TCATGCGTTG CAACTTTTTG TGCAATATTA AGTGCGAACG CAGTCTTACC TACAGATGGA 840
 45 CGCGCTGCAA GGATAATTAA ATCATTTTCG TTGAACCCCTG CTGTCATTTG GTCTAAATCT 900
 CGATATCCTG TAGGTATACC TGGTGTGTTGA CCACTATTTT GATCAAGCTC TTCAGCTGTT 960
 50 TCATACACTT GTCCTAAGAC GTCTCGAATG TCTTTAAAGC CATCGCTTTC ACGAGAAGAT 1020
 GATAGCTCTA AAATTCGACG TTCTGCATCA CTTAAAATCG CATCTAGTTC AAGTTCATCA 1080
 TTATATCCAT CATTGGCAAT ACTATCTGCA GTTTGAATCA ATCTACGTTT TAATGCATGC 1140

TCTGCAAGAT ATTGCGGGCC ACCCGCTTcA TTCAACGTAC CTTCCGTCGA TAATTGATCC 1260
 ATCAATGTTA CAACATCAAT TTCTTTATTA TCTTCATTTA AGTGCATCAT TGCACGGAAA 1320
 5 ATATGTTGAT GGGCACCCCT ATAAAACGAC TCAGGAAGCA AAATTCCTG AGTAGTATTA 1380
 ATCAATTCTG GATCTATAAT AATTGAACCT AAGACAGACT GTTCAGCTTC ATTGTTATGC 1440
 10 GGCATTTGAT TTGCTCATA CATTCTATCC ATGAATGGTT ACACCTCTTA TTTCAATCCA 1500
 ACTTTATTGT TCAACTGTGT GTACGCGAAT TGTACCTTCA ACTTCTTTAT CTAATTTAAC 1560
 AGGTACATTC GTATATCCTA GGAATGAAT TCCATTTGGT AAATCCATTT TACGTTTATC 1620
 15 AATTTTAATA TCATGTTGTG CTTTtagTGC TTCGGCAATT TGTTTTGTAC TTACTGACCC 1680
 AAACAATTTA CCACCTTCAC CAGTTTTTGC TGaTACTTCA ACTTCAATGT TTGATAACGT 1740
 TTCTTTTAAT GCTTTAgCAT CTTCAATTTT TTGTTGGCGT TCTTGTTTTG CACGTTTTTT 1800
 20 CTGTAACCTCT AATTGTTTAA GGTTACCTGG TGTTGCTTCT ACAGCATAAT TCTTTTTCAA 1860
 TAAGAAGTTA TTGCATAAC CTA CTGGTAC TTCTTTAACT TCACCTTTTT TACCTTTACC 1920
 TTTACCTTTA ACATCTGTG TAAAAATTAC TTTTCATGCAT CTTCACTCCT ACTTAATTGT 1980
 25 TCTGTAATTG CTTGTTGTAA TTGTGCTATC GCCTCTTCGA CTGTCACACC TTTAAGTTGT 2040
 GTTGCCGCAT TGGTTAAATG TCCACCGCCA CCAAGTGCTT CCATTGTTAA CTGGACATTT 2100
 30 ACTGAACCGA GTGAACGCGC AGATATACCA ATCAGATTAT CTTACAGTCT CGCAACAACA 2160
 TATGATGCTT CAATACCTTC TAACTTTAAC AGTTCATCTG CTGCTTGTGC AACTGTTACT 2220
 GGATGATAAA TTTTATCGTC TGAACCATGC GcAATGGCTA TGCCATTATC TTCAACTTTT 2280
 35 ACAGTTCGAA TTAATTCAGA TCGATTAATG TAAGTATCCA CATCATCTTT TAAGAAATGT 2340
 TCGGTTAAAA TCGTATCTGC ACCATGTGCA CGTAAATAAC TCGCTGCATC GAATGTTCTT 2400
 GATCCTGTTC GTAATGTAAA GTTTCTTGTA TCTACAATAA TACCTGCATA CATCACTGTT 2460
 40 GATTCAAGAC GTGTTAAACG TTGTTCTGTT GGTTGATATT CCAGTAACTC TGTTACCAAT 2520
 TCAGCTGTG AACTTGCCTA TGGTTCCATA TATATCAACA ATGGATTAGA GATGAAGCTT 2580
 TCACCACGTC TATGATGATC GATAACAACCT TTACGGTTTG CTTTATTTAA GACATTTTCA 2640
 45 TCTAAAACCA GTTCCGGTTT ATGCGTATCA ACAATCACTA CGGTTGTCTT AGATGTCATC 2700
 ATATCCCAAG CATCATCTGA TGTAATAAAT CGCTCTCTTA ACTCTGGCTT TTTATCTATT 2760
 50 TCGTTCATCA CGCGTCGTAA TGTTGGATCA ATGTCAGTCT CATTTAATAC GATGTATGCT 2820
 TCTAAATTAT TCATCATTGC AAATCTAGAC ACACCGATTG CTGCACCAAT TGCACTAAG 2880
 TCAGGACGTT TATGTCCCAT GATAATGACT TTGTCACCCT CTGCAAGGAT ATCTTTTAAC 2940

55

EP 0 786 519 A2

CCATAGAAAC GCACATTACC ATTAATACTT TTAATTGCAA CTTGGTCGCC ACCGCGTCCT 3060
 AATGCTAAGT CTAGGCCTGA TTGTGATAAT TCACCTAAGT CGATTAAATT TTCAGTACCT 3120
 5 TCACCAACAC CGATACTTAA TGTTAATTGG GCACGATAAC CAACACTTTT TTCACGTAAT 3180
 TGACTCAAGA TATCAAATTT AGATTCTTCT AAGTCAGCTA ATATTTTTTG ATTTAAATAG 3240
 GCTACGAATT GATCGGAACT GTATCTTTTG AAAAATATAT TATACTCAGT TGCCCATCGA 3300
 10 CTAATGACAC GCGTTACCAT TGAGTTGATT TCCGAACGCT GCGTATCATT CATATTTTGC 3360
 GTAATCTCAT CGTAGTTATC TAAAAATAAT GTCGCAATGA TTGGTTTAGA ATTTTCATAT 3420
 15 AGTTCATTTG TTTGTACTTG TTCAGTTATA TCAAAGAAAT AGAGGCAGTG ATCATTCTCA 3480
 GAATAACGTA CTTGGAAATG ATACTGATTA TATTCTATTT CAACGGATTT CACTCTATCT 3540
 AATTGCTTTA AAATGTTTGG AAATACTTCA TTTACAGATT CAGAAATGAC ATTCGCTTCC 3600
 20 ATATGATCTG TCATAAATTG GTTAACCCAT TCGATGTGAT CATTTTCATC TAAAACAATG 3660
 ATACCAATTG GTAAATGTTT GATTGCTTTA TTATTTGTTG TTGAAATTTG AGCACTCAAA 3720
 CCATCTACAT AACTATCCAT TTTCAATAAA GCTTGTCTGA ATAAATGAT GCTAACAATA 3780
 25 ATCATCACGA CAAGAACGAT AGATGCAATT AGTGCTATAA GACTATTAAA GATAAACCAT 3840
 ACACCCATTA AAACAATTGC TGTGATGATC ATGATGACAA ATGGTATTAG TAAAGCTTTC 3900
 TTAGTGGACT GCCGATTCAT TATTCCACCT CTATTCACCT TTTAGAATTA TTTTTCATGA 3960
 30 TTCGCTTCAA ATTCAAACTT AAATCGATAA CACCAAGTAG TCCTACAATA TGTGTCGTAG 4020
 GTGTCAGTAT TGTACCGATA ACCAATAGTA AAATCGTTAC TGCATTCGGC AAACCTTTTCG 4080
 CTTTACCAAA GAAATGAATA ACACTTAAAC CTTGAATATA CATTACTAAT GATAACACAA 4140
 35 GTTGAAGTT TAAAAGAATG CTCTGGAACA CACTCGGTTG ACCTGTAAAT AATAACATA 4200
 TGATAACAAT AATGTATATC CATAATAAAA TACCGCTCAT TTGCCACGCG AAAAGTGGCT 4260
 40 TAAATACAGG TGTAGCGATT TTAAATTTTC GTAAAATCGG AAATGTAACG ATTAAGTTAA 4320
 TTAAGACGAT TAAAAATGTA ATGATAATGA TGAAACCTGG TAATTGAACG GTCGCTTGTC 4380
 TAAACCCCTC TTCTAATATT TGGGTCATAT TCGCATCGGC ACCGCTCATC GTAATCGCTT 4440
 45 CATGTAATGT TTGCTTGAAA GGTTTTACTA TGCTCGCTGA TGGTGAATC CTTCCGAATG 4500
 TTTGTAGTAA CATAAAAGCG ATTAATGAAA TTAATCTCAT CGCTACTGTT GTTACGTATA 4560
 ATATTCTTTC TTTAGACGTT CTTTCTTTGA GCAATTGACC AATAATTAAA CTGCAATTA 4620
 50 AGACTAATAT GATGGCACTT AAAACGAAAG TATTACCTAA AACAGTTGTT ATAATTACTG 4680
 TAATAAGTGC ACTAATCCCG AAAGATTGTA TTGATTATT CCATAAAACG ATACCTGGTA 4740

55

	CAAATACCAA CGCAATCGTT GCAATTATTG TTGCTTTAGG TTGTATTTTT GAAAACACAT	4860
	AAGCCACTCC CATATTTTAA ACTATAGCTA TTATTTTAAC CTCTTTAATG AAAATTAACA	4920
5	ATTTATAGAT TGTATGCTTC TATTTCAATT AATTGAATAA TAACTTTCAT GTTTTATAAG	4980
	TAATTAACAT ACTCATTTGA ATCGCTTTTG TGTGCTTTCA TTTCAACAT GATTATTTAA	5040
	TCCCACTACA TAGCAATCAA GCTTGATTTA GATTACAAT ACATTTCCAC TCTCATGTAC	5100
10	TCTAGATGTT TTTGAATATG ATAAGTGTGA TTTAGTGGCT TCATTCTTTG AAAATATATA	5160
	TTATTACTTA CGCTTAAAT GCTTTAAATT TAAGAAATGA TATAAGTTAG GTGCCCAGGT	5220
15	ACTAAAGTTT AGTAGGATC CATCATGCCC AACATTATCA GGCACGAAGA AATGACGATG	5280
	ATATTTAAAA CGTTCACCTA ATGCACGAAC TTGATCATCC GGATATAGCA AATCATCTAT	5340
	GAACCCCATC GTTAACACTT TTGTTTCTAA ATTTTAAAA ACATGCGTTA CGTCTGTGCG	5400
20	ACCTCGGTCA ATGTTGTGAC TATCCAATAC ATCTAGCAGT GTCAGATAAC AATTCAAATC	5460
	AAAATGTTCT TTAAATTTAT TACCTTGATG TTGTTGGTAT GCGACTACTT CATCCGGCGT	5520
	AAAACGTTCA TCATAACTTT TTGATGATCG ATATGTCAAA AAACCTAATT GGCGTGCAAT	5580
25	ACTTAGACCT TCCTTACCAC CAAGATGAAT GGCTTGCCCT GCAATTTTCAT TGAAAGCTCT	5640
	ACTATAAGAT GATGTTGAC TTGTTGCAGC AAGGATAATG GCTTTATCTA CTTCAAACCTG	5700
	TTGATTGTAG AGTAGTTCCA TTGCTTGCAT ACCTCCAAGA CTTCCCCCTA TTAAATATT	5760
30	AATCTTATCA TAACCAAGGG CTGTATACC TCGTTCATTC GCTCTGACTA TATCTCTTAA	5820
	TGTTAATTTT TTAGGAAAAT GAGGGTCGTT TAAAGGTGAA CTTGAACCGA AAGGACTACC	5880
35	AATAACATCA AATGTTAAAA ATTGATAATC GTGAATGGGT ATATATCCCC CATCAATAAT	5940
	TTCTCGCCAC CAACCCGGAT AATCATCTGT TCCATATGTT AAATGATTGC CAGTTAATGC	6000
	ATGACAAACT ACAACTAATG GTTGTCCATG ATAACCGACA TGCTCATATC TCAAACGCAA	6060
40	GTAATCTATG ACTTCCCCAG ATTCTGTAAT AAATCCCCT AAATTTAAAG TATCTACTGT	6120
	GTAATTTGTC ATTGTTCTTT CCTCCTTAAA CAAAAAACT TCTCACCCTA TTGAAAAGTA	6180
	AGAAGTCTTT ATACTTATCA TTCGAGTAAC TCGTTGGTTT TAGCACCGTG CTATAAAGTC	6240
45	GGTTGCTGAA GTATCACAGG G	6261

(2) INFORMATION FOR SEQ ID NO: 13:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1222 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

	ATGCGATTAA CTCTGGAAAT ATCTTTTCCA TATTTACGTh TTAAATTATT CAGCAAATTC	60
5	ATACGAGaTT CATACTCGTT yAACTTGT TCGTCGAATT CTGTATTAGC CATTTCATCA	120
	TATAACTCAT GTTTTGCATC TTCTAAAATG TAGTAAAATT GATCAATATC TTCTTTTAAT	180
	TTGTCATATT TGTTTGAAC TATATCGTTT ATTGTTAACA AATGGTTGCT TAGTTCATAT	240
10	AAACGATCAG TGATAGCATT TTCATCCGTT AATGTCATAT ATGCGTTATT AAGCGCTAAG	300
	CTTAATTTTT CAGAGTTTTG AATGCGTTTA ATATCTATTT CAAGTTGCTC TATTTGCGCT	360
	TCTTTTAGAT GTGCTTCAGA CAATTCTTCT AATTGGAATT TCATTAAATC TAAACGCTGT	420
15	AGCAATGCTT GGTCTGCTGA TTCTAAATCT TCTAACTCTT GCTTTTTGGC TTTATAATTT	480
	TGAAAAGTTT GGTGATATTT ATCCAACAAA TCTTGATAAC GTGATTCTGC GTAATTATCC	540
20	AATAATGTTA AATGGTATTT TTGTTTCAAC AAAGACTGCG TTTTCATGTTG GCCATGAATA	600
	TCTAATAATT CTTGCATAAC TTTTCGTAAA TCTTGTAAG TAACTGTTG ATTATTAATT	660
	TTACAAAGAC TTTTACCAGA GCTGAAAATT TCCCGTTTAA CTAATAAAAA ATCTTCATCT	720
25	ACATCAATAT CCATATTTTT CAATATATGT ATAGCATCTT TACTCTCGTC AATATCAAAT	780
	ATACCTTCGA TGACAGCCTT TTTTTCACCA TGTCTTACAA AATCAGATGA AGCTCTCATT	840
	CCAATTAATT GTCCAATTGC ATCTATAATA ATTGACTTAC CTGAACCCGT TTCACCACTT	900
30	AAAACAGTTA AACCATCAGA AAATTGAATT TCTAATTCTT CAATAATAGC AAATTGCTTG	960
	ATTGATAAGG TTTGTAACAT AAATCATCG CATCCTTATA ACAAATTGAA AATTCTTGAC	1020
35	TTGATTTTCA CACTTGCCCTC TTTGCTTCGA CAAATAATTA AACAAGTATC ATCACCACAA	1080
	ATTGTGCCTA GTACTTCTTC CCAATTGATT TGGTCTAATA TAGCTCCAAT AGATTGTGCA	1140
	TTACcAGGTA TGTTTTTAGA ACAAGTAAAT TATCAGTACC ATCTATATTA ACAAAGGAAT	1200
40	CCATTAAATA ACGTCCCAAT TT	1222

(2) INFORMATION FOR SEQ ID NO: 14:

(i) SEQUENCE CHARACTERISTICS:

- | | |
|----|-----------------------------|
| 45 | (A) LENGTH: 1021 base pairs |
| | (B) TYPE: nucleic acid |
| | (C) STRANDEDNESS: double |
| | (D) TOPOLOGY: linear |

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

	TTTGTTATTA TTACnTnAAA TAATTGCATT ACTTTTTACT GATGGTACAA CTTTCCATCC	60
55		

TTCTTTTGGC ACGACATAAT TGTCTTTATC TTGAACTAAA TATCCGCCAG ATACTGAAAC 180
 AAACCTCTTCT TCGTTACTGT CTATAGTCAT ATCAATTTCT AATAATCTTA CATTCTTCTT 240
 5 TTGTTTTTAAA ATATCTAATG CTTTCATCTGT AAATTTTGGT GCAATAATGA CTTCCAAAAA 300
 GATACTATGC AATTGCTCTG CTAACCTCAGG TGTTACAGCT CGGTTTAATG CAACAATTCC 360
 10 ACCAAATATT GATTGACTAT CCGCTTCATA CGCATGTTGA AATGCTTGTT CTATCGTGTC 420
 ACCGATACCA ACACCACATG GATTCATGTG TTTAACCGCA ACTGTAGCAG GTGTATCAAA 480
 CTTTTTAACT AAAGCTAGTG TAGCATCTGC ATCTTTAATA TTGTTATAGC TTAATTGTTT 540
 15 CCCATGTAAT TGTTTAGCGC CTGCAATCGT GTGCTTAGCA TTCGAAGTTC TCACAAAATA 600
 CGCTGATTGT TGTGGATTTT CTCCATATCT TAAAGTTTCT TTATCCCCTT TAAAGAAACG 660
 TACAATCGCT TCATCATATT CTGCAGTATG CTCAAAAAC TTAATCATT AATGATTGTCT 720
 20 ATATGACTCA TCTAACGAAT CGTTTCTTAA TCGCGTCAAT ACTTCTTGAT AATCTGCCGG 780
 ATGTACAATT GTTGTTACAT GTTTATAGTT TTTAGCTGCA GCACGTAACA TTGTTGGACC 840
 ACCAATATCA ATATTTTCAA TTGCTTCGTC CATCGTCACA TCAGGGTTTG CAACAGTTTG 900
 25 TTGGAATGGA TATAAATTAA CTAATACCAT ATCAATTAAA TCTATATGTT GTTCTGATAA 960
 TTCATTTAAA TGCTGCGGTT TATTTCGATC AGCTAAATG CCACCATGAA CAGCCGGATG 1020
 T 1021

(2) INFORMATION FOR SEQ ID NO: 15:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 3759 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

TCATTCACCTC CTAAATTGTT ATTACACTAT TACACaTAGC TAATCATCAA TGTGAAATCA 60
 CCTTCAAAGA CACTATCCAA ATCTTCAGAA GTCAAAATAA AGTTTGTACC AGTAGTCAGT 120
 45 TTGAAAATTT CACCATCGAC AATCATTTGC CCTTCGCCTT CCAACACTGT AACTAAACAG 180
 AACTCTCTAG GCTTCATATA ATTAAACGTG CCAGAAATTT CCCATTTAAC CAATGTAAAG 240
 AAATCATTCG ATACAATGTG TGTACACTTA TGGTTTTCAA TAATTTGCTT TTCAGGCAAA 300
 50 ATATTAGGTA ATGGTGCATT GTACTGAATA ACGTCTAAAG CTTTTTCAAT ATTAAACGGT 360
 CTATCATTAT ATTGATTATC TTGACGATTG AAATCATAAA GTCTATATGT AATGTCTGAC 420

EP 0 786 519 A2

	ATAAAatAGa ATTcyCCAGG kTTTACTtTA AtatATCyAA gTatCGaCtC tATCGTTCCG	540
	TGTTGAACAT GATTcGCAAC TTCTTCTCTA GACTCTGCTA ATGTCCcTAT AACTATTTCT	600
5	GCATCTTCTT CTGCATCTAT AATATACCAA CATTcAGATT TGCCATATTG CCCgTTTTCA	660
	TGCTCATAAG CATAAGAATT ATCAGGGTGC ACATGAATAG AAAGTGATTc TCTTGcATCC	720
	ACTATTTTAG TTAGAAGCGG AAAATCTTTG CTtGGGAAAT CACCAAACAA TTCACGATGT	780
10	TCTGACCAAA TACGGTCTAA TGTTTGACCT TGATATGGTC CATTAAATAAT CTCGCTCGTA	840
	CCATTTGGAT GTGCTGACAC ACACCAACAT TCCCCAGTT GTATCATTGT CTAATTGATA	900
15	TCCAAACTCA CTTAGACGTT GACCGCCCCA TAATTTTGTT TTTAAAATTG GTTGTAaaaa	960
	TAATGGCATT GTTGcACCTC CATTGTGATT AAGTAAGCAA TAGAACTCTG ATGTTGTGTG	1020
	TCCATTATAT TTTGATTTTG TTCTCATTTA CATCGTATTA TTAACCTCCA CATTTCAAAT	1080
20	TAActATTAG TGATTGTACC ATATTTACTA ACATTGCAGT ACTGCCAATT AAAAGnGCTT	1140
	CACTTAAATT TACAGTACTT TAACATTTTC AAAAATTTAT AGCATAGAGA TTATATCTCT	1200
	CTTACATTTG TACATATTTc CCTTTAAATT TACTCGCCCA TTATACCAAT TAATAaACAA	1260
25	CTTTAATAGT TGTGCCATAC ATTGTTCAAA TTCTTTGTAA AACGCATAGA CAATACGTAC	1320
	TTATTCATAC TTATAATTCA TCATTTTCAA AAAATAACGA GTTACGAAAA AGTAACCCGC	1380
	TTCAAATCAT ATTTACTATC CTTATTAATC CGTTTCATTT TCAAATTGAG TTAAAGCATC	1440
30	TTTAATGTCC TGATCACCAC TAATAATTG AACTCTTGG TGATTAAAAT GATTGGATGT	1500
	GACAATTTCT TTTAATACTG TCGCAACATC TTCTCTAGGA ATTTCACTT TACCATCAAA	1560
35	ATATTGTGCA GCTTCTATCT TTCCAGATCC TGCTGCATTT GTAAGTGCCC CTGGATGTAA	1620
	AATTGTATAA TTCAAACCTG nAACGTCTTA AATAGTCATC AGCGTAATGT TTAGCTATTG	1680
	TATATGGCTT TAAATCACCG CTATCATCAA AAGCCTGACG TCTCGAATCA TATGTTGAAA	1740
40	CCATGACATA GTGTTTAATA TTGGCCTCTT TACTCGCAAT CATTGATTTA ACAGCACCAT	1800
	CTAAATCGAC AATAATTGTT TTATCTGCAC CCGTGTCCC TCCAGAACCT ACTGAAAAGA	1860
	TAACTTTATC GAATGGTTTA AACGTCTCAG TTAAAGTCTC TATTGAATCA TTTTCAACAT	1920
45	CAACAAGAAT TGCTTTcATA CCTTGtGATT TTAACGCATT AAGTTGATCT GATTGCCTAA	1980
	CACCAGCAGT AAATGGTACA TTTTCTTTTG CTAATTGTTG CACTAGTAAC GAACCTACAC	2040
	CGCCATTAGC ACCTATAACC AAAATATTCa TTTACAACAC TCTCCTATkt ATTATTCTCT	2100
50	ATGCCATACC ACTTTATGAG ATATGTAAAA CTtGTTACAA CTATAAAAAAT CAATTGACAT	2160
	ACTACTGGGA ACGTATTAAA TTAATATATG AACAAATATT CATATGAAAG GATTGTCATA	2220
55		

	tCaAGGCATT AGcGATTACA ATCGAATACG TATCaTGGAA TTGTTATCaG TCAGCGAAgC	2340
	AAGTGTGGT CACATTtCAC ATCAATTGAA TTTATCTCAA TCAAATGTCT CGCACCAATT	2400
5	AAAATTACTT AAAAGTGTGC ATCTTGTGAA AGCAAAACGA CAAGGCCAAT CAATGATTTA	2460
	TTCATTAGAT GACATCCACG TAGCAACTAT GTTAAAGCAA GCCATACATC ACGCGAATCA	2520
10	TCCTAAAGAA AGTGGGTTAT AATATGTCTC ATTACATCA TCATCATGAC CATATGCATA	2580
	GTCATGTAAC TACAAATAAT AAGAAAGTAT TGTtTATATC GTtTTTAATA ATCGGTCTAT	2640
	ATATGTTTAT CGAAATCATC GCGGTCTCC TTGCTAACAG CTTGGCATTa CTATCTGACG	2700
15	GTATCCATAT GTTTAGCGAC ACATTCTCAT TAGGTGTTGC ACTTGTCGCA TTTATTTATG	2760
	CTGAAAAGAA TGCCACAACt ACAAAAACAT TTGGTTATAA ACGTTTCGAA GTACTCGCAG	2820
	CGTTATTTAA CGGTGTAACG CTTTTTGTAa TAAGTATTTT GATTGTTTTT GAAGCGATTa	2880
20	AACGTTTCTT TGTTCCTTCT GAAGTTCAAT CAAAAGAAAT GTTAATCATT AGTATTATCG	2940
	GTtTAATTGT CAATATCGTT GTTGCAATTCT TTATGTTTAA AGGCGGCGAC ACTTCACACA	3000
	ATTTAAATAT GCGTGGTGCT TTTCTACATG TTATCGGAGA CTTATTAGGT TCAGTTGGCG	3060
25	CCATTACTGC AGCTAkTTTA ATTTGGGCAT TTGGATGGAC AATCGCCGAT CCTATCGCAA	3120
	GTATTTTAGT TTCCGTTATT ATTTTAAAAA GTGCTTGGGG TATCACAAAA TCTTCAATTA	3180
	ACATTTTAAT GgaAGGCACA CCAAGTGATG TTGATATAGA TGAAGTTATA ACTACTATTA	3240
30	AAAAGGATTC ACGAATACAA AGTGTGCATG ATTGCCATGT TTGGACAATT TCAAATGATA	3300
	TGAATGCATT GAGTTGTcAT GTTGTGTAG ACCATACATT GACAATGAAA GAATGTGAAT	3360
35	TATTATTAGA AAaCATTGAG CATGATTTAT TACATTTAAA TATTCACCAT ATGACTATTC	3420
	AATTAGAAAC GCCTAATCAC AAACATGATG AATCGATTAT ATGTTcAGGA ACACATAGTC	3480
	ATTCaCATAA CCATCATGCT CATCATCACG CGCATGTACA TTAATAATTT TAACCTACTG	3540
40	CCATTGCATC GATTAAACTT TTCAATGGCA GTAGGTTTTT TATGTCTTTA TGGCGACTTG	3600
	TTTGGTCTTT GATGATGCAA TGTTTATTAA CAAATTTTCA ACTATTATTT CTTACATTAG	3660
	TCATATTTTT GACAATTTAc TATTATAATT CTCTAACTTT AGTCACTTTA ATTAATTTTT	3720
45	ATTAGATATT AATATGAAAA TAACGTGTTT TTTGTTATT	3759

(2) INFORMATION FOR SEQ ID NO: 16:

(i) SEQUENCE CHARACTERISTICS:-

- (A) LENGTH: 13086 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

	TAATTATCGC GCATAACAAA ACATTAGCAG GACAATTATA TAGTGAGTTT AAAGAATTTT	60
5	TTCCTGAAAA CAGGGTGGAA TACTTTGTAA GTtACTATGA TTATTATCAn CCAGAGGCAT	120
	ACGTACCGTC TACTGACACT TTTATTGAAA nAGATGCCTC AATCAnTGAT GAAATTGATC	180
	AACTACGACA TTCTGCTACA AGTGCATTAT TTGAACGCGA TGATGTAATT ATTATTGCTA	240
10	GTGTAAGTTG TATATATGGT TTAGGTAATC CTGAAGAATA TAAAGATTTA GTAGTAAGTG	300
	TTCGAGTTGG TATGGAAATG GATAGAAGTG AATTACTTAG AAAACTTGTC AGATGTGCAA	360
	TATACACGAA ATGACATCga TTTcCAACGA GGAACGTTTC GAGTGCCTGG TGATGTAGTG	420
15	GAAATATTCC CAGCCTCTAA AGAAGAACTT TGTATAAGGG TTGAGTTTTT CGGCGATGAG	480
	ATTGACCGTA TCCGAGAAGT TAACTACCTA ACAGGTGAAG TGTGAAAGA AAGAGAACAT	540
20	TTTGCGATAT TCCCAGCTTC TCACTTCGTA ACACGTGAAG AAAAGTTGAA AGTTGCGATT	600
	GAACGTATTG AAAAAGAATT GGAAGAACGA TTGAAAGAAT TACGAGATGA GAATAAATTA	660
	CTAGAAGCGC AAAGGTTAGA ACAGCGTACC AACTATGATT TAGAAATGAT GCGAGAGATG	720
25	GGATTCTGTT CAGGAATTGA AAACATTCC GTACATTAA CTTTGCACC ACTGGGTTCCG	780
	ACACCATATA CTTTATTGGA TTACTTTGGC GATGATTGGT TAGTAATGAT TGATGAATCA	840
	CATGTGACAT TACCGCAAGT TCGAGGCATG TATAACGGAG ACAGAGCGCG TAAACAAGTT	900
30	TTGGTGGATC ATGGGTTTAG ATTACCGAGT GCATTAGATA ACCGTCCACT TAAATTTGAA	960
	GAATTTGAAG mAAAGACAAA ACAACTGTG TATGTATCTG CAACGCCTGG ACCATACGAA	1020
	ATTGAACATA CGGATAAGAT GGTGAACAA ATTATTCGTC CTACTGGTTT ACTGGATCCT	1080
35	AAGATTGAGG TTAGACCTAC TGAAAATCAA ATTGACGATT TATTAAGTGA AATTCAAACA	1140
	AGAGTgAGCG TAATGAACGC GTACTTGTTA CAACGCTCAC TAAAAAGATG AGTGAAGATT	1200
40	aACCACATAC ATGAAAGAAg CGGGTATTAA aGtAATTAT CTGCATTCAG AAATCAAGAC	1260
	ATTAGAACGA ATTGAAATAA TTAGAGACTT ACGAATGGGT ACATATGATG TTATCGTAGG	1320
	TATTAATTTA TTAAGAGAGG GTATTGATAT ACCAGAAGTT TCTCTAGTTG TCATATTAGA	1380
45	TGCAGATAAA GAAGGGTTTT TACGTTCTAA CCGCTCATTa ATTCAAAaCAA TAGGTAGAgC	1440
	TGCGCGTAAC GATAAAaGGTG AAGTCATTAT GTATGCCGAT AAAATGACTG ATTCGATGAA	1500
	GTATGCAATT GATGAGACAC AACGTCGTCG AGAAATACAG ATGAAACATA ATGAAAAACA	1560
50	TGGTATTACA CCTAAAACAA TTAATAAAAA AATACATGAT TTAATTAGTG CTACTGTTGA	1620
	AAATGACGAA AATAATGACA AAGCACAAAC TGTGATACCT AAGAAGATGA CGAAAAAAGA	1680

55

EP 0 786 519 A2

	TTTCGAGAAA GCTACAGAAT TAAGAGATAT GTTATTTGAA TTAAAAGCAG AAGGGTGACA	1800
	AGTAAATGAA AGAACCATCC ATAGTAGTAA AAGGTGCTCG TGCGCATAAC TTGAAAGATA	1860
5	TTGATATCGA ACTACCTAAA AaTAAATTAA TTGTTATGAC AGGTTTATCT GGGTCAGGTA	1920
	AATCGTCATT AGCATTTCGAT ACTATATATG CTGAAGGACA ACGACGTTAT GTTGAATCAT	1980
	TAAGTGCCTA TGCGCGTCAA TTTTtagGCC AAATGGACAA ACCAGATGTT GATACAATTG	2040
10	AAGGATTATC GCCAGCAATT TCAATAGATC AAAAAACAAC AAGTAAAAAT CCAAGATCAA	2100
	CTGTAGCAAC AGTAACAGAA ATATATGATT ATATACGTTT GTTATATGCA CGTGTGGTA	2160
15	AACCTTACTG TCCAAATCAC AATATAGAAA TTGAATCGCA AACAGTACAA CAAATGGTTG	2220
	ACCGCATTAT GGAATTAGAG GCACGTACAA AGATTCAATT ATTAGCACCT GTCATCGCTC	2280
	ATCGTAAAGG TAGTCATGAA AAGCTAATCG AAGATATTGG TAAAAAAGGT TATGTACGTT	2340
20	TAAGAATCGA TGGCGAAATT GTTGATGTAA ATGATGTACC TACTTTAGAT AAGAACAAGA	2400
	ATCATACAAT AGAAGTTGTT GTAGACCGAT TAGTTGTAA AGATGGAATT GAAACACGAC	2460
	TAGCTGACTC TATAGAAACT GCCTTAGAGC TTTCAGAAGG ACAATTAACA GTCGATGTCA	2520
25	TTGACGGGGA AGACCTTAAG TTTTCAGAAA GCCATGCTTG TCCTATATGT GGATTTTCAA	2580
	TCGGAGAGTT AGAACCAAGA ATGTTTAGCT TTAACAGTCC TTTTGGTGCT TGTCCGACAT	2640
	GTGATGGCTT AGGCCAAAAG TTAACAGTCG ATGTAGACTT GGTGTTCCTT GACAAAGATA	2700
30	AGACGCTAAA CGAAGGTGCA ATAGAACCCTT GGATACCGAC GAGTTCTGAT TTTTATCCAA	2760
	CATTGTAAA ACGTGTGTGT GAAGTTTATA AAATCAATAT GGATAAACCT TTTAAAAAGT	2820
	TAACAGAACG TCAACGTGAT ATTTTATTGT ATGGTCTGCG TGACAAAGAA ATTGAATTTA	2880
35	CATTTACACA ACGTCAAGGT GGTACTAGAA AACGAACAAT GGTTTTCGAG GGTGTAGTTC	2940
	CTAATATAAG TAGACGATTC CATGAATCTC CTTCAGAATA TACACGTGAA ATGATGAGTA	3000
40	AATATATGAC TGAACCTACCT TGCGAACTT GTCATGGAAA GCGATTGAGT CGTGAAGCKT	3060
	TATCTGTTTA TGTAGGTGGT TTAAATATTG GTGAAGTAGT CGAATATTCA ATCAGTCAAG	3120
	CGCTGAACTA TTATAAAAAC ATTGATTTGT CAGAACAAGA TCAAGCGATT GCAAATCAAA	3180
45	TATTGAAAGA AATTATTTCC CGACTCACTT TTTTAAATAA TGTGGGACTT GAATATTTAA	3240
	CGTTAAACAG AGCTTCAGGT ACACTTTCAG GTGGTGAAGC ACAACGTATT CGATTAGCAA	3300
	CGCAAATTGG GTCGCGTTTG ACTGGTGTCT TATATGTATT AGATGAGCCA TCAATTGGAC	3360
50	TGCATCAAAG AGATAATGAT CGATTAATTA ATACACTTAA AGAAATGAGA GATTTAGGAA	3420
	ATACTTTAAT TGTAGTTGAA CACGATGATG ATACAATGCG TGCGGCTGAT TACTTAGTGG	3480

55

EP 0 786 519 A2

	AGGTAATGAA AGATAAAAA TCATTAACAG GACAATACTT GAGTGGTAAG AAACGTATTG	3600
	AAGTACCTGA ATATCGCAGA CCGGCTTCAG ATCGTAAAAT TTCTATACGT GGAGCTAGAA	3660
5	GCAACAATCT TAAAGGGGTT GATGTGGACA TACCACTATC AATCATGACG GTTGTTACAG	3720
	GTGTATCAGG TTCTGGTAAA AGCTCATTAG TAAATGAAGT ATTATACAAA TCATTAGCTC	3780
	AAAAAATTAA TAAATCTAAA GTAAAGCCAG GATTGTACGA TAAGATTGAA GGTATTGATC	3840
10	AACTTGATAA AATTATTGAT ATTGATCAAT CACCAATAGG TAGAACGCCA CGCTCTAATC	3900
	CAGCAACATA TACTGGTGTG TTTGATGATA TACGTGATGT GTTTGCGCAA ACAAATGAAG	3960
	CTAAAATTCTG AGGATATCAA AAAGGGCGTT TTAGTTTTAA TGTAAGAGT GGACGCTGTG	4020
15	AAgcTTGTAA AGGTGACGGT ATTATTAAAA TTGAAATGCA TTTTTTACCT GATGTTTATG	4080
	TTCTTGTGA AGTGTGTGAT GGTAAACGAT ATAATCGTGA GACACTAGAG GTTACTTACA	4140
20	AAGGTAAAAA TATTGCTGAC ATTTTAGAAA TGACTGTTGA AGAAGCAACA CAATTTTTTG	4200
	AAAATATTCC TAAGATTAAG CGCAAGTTAC AAACACTAGT TGATGTTGGT CTTGGATACG	4260
	TCACATTAGG TCAACAAGCT ACAACGTTAT CAGGTGGTGA GGCTCAACGT GTGAaACTTG	4320
25	CATCTGAAGT TCATAAACGT TCAACTGGTA AATCTATTTA TATCCTAGAT GAACCGACAA	4380
	CAGGGTTACA TGTTGACGAT ATTAGTAGAT TATTAAGAGT ATTAAACCGA TTAGTTGAAA	4440
	ATGGTGATAC TGTGTGAATT ATTGAACATA ACCTAGATGT TATCAAAACA GCAGACTATA	4500
30	TTATAGACTT AGGTCTGAA GGTGGTAGTG GCGGTGGTAC TATTGTTGCG ACTGGCACAC	4560
	CCGAAGATAT TGCTCAGACA AAGTCATCAT ATACAGGAAA GTATTTAAAA GAAGTACTTG	4620
	AACGAGATAA ACAAATACT GAAGATAAAT AAGATTAAAA GAAGTGAAGG ATGTTATAAA	4680
35	TTTATCCTTC GCTTCTTTTT ATTAATTTAG TAATGAATAG TAGAAAGAAA AGATGCGTAA	4740
	AAAGaATTAT GTTAAGATAG GGTCAATCTA GAGTAGTTAA ACATAAATCG AACTGGGAGT	4800
40	GGGACAGAAA TGATAAAGAA TCACTAATGA TTTATTATGT AGTGGTTCTT TGTCATTAGC	4860
	CACAGCTATT GTGTACTTAA AAATAGGaT GCaTgAGTGC AACTCATGCA TAAGaAATAC	4920
	TAATTTCTAA AGAAAAAGTA TTTCTTTATG TTGGGGCCCC GCCAACTTGC ATTGTTTGTA	4980
45	GAATTTCTTT TCGAAATTCT TTATGTTGGG GCCCCGCCAA CTTGCATTGT TTGTAGAATT	5040
	TCTTTTCGAA ATTCTTTATG TTGGGGCCCC GCCAACTAAT TCCAATATAT CATTGTAGAG	5100
	CTTAGGTCAT TGATTTTTTG CTCGGACTTT TATGGCGATA TGAACCATGT AAATTAAGCA	5160
50	AGCAATAAAT TAATGATTGA TATTGACTTG TAAAATAATA ACAATAATGA ACAATTAATA	5220
	TTTATTTTAG CTTTCAATG TAGATTGGTG TTATATTTTT GATATGATAA GAAGAGATGT	5280

55

	ACATTAAAGT TAGATTTAAT CGCTGGTGAA GAAGGACTAT CGAAGCCAAT TAAAAATGCT	5400
	GATATATCAA GACCGGGCTT AGAGATGGCA GGTATTTTT CACATTATGC GTCAGATAGA	5460
5	ATACAACTAT TAGGAACAAC GGAACATATCG TTTTACAATT TATTACCAGA TAAGGATCGC	5520
	GCAGGTCGTA TGCGTAAACT ATGCAGACCA GAAACGCCCTG CAATTATTGT GACACGTGGA	5580
	TTGCAGCCAC CAGAAGAATT AGTTGAAGCT GCAAAGAAT TAAATACCCC ACTTATAGTT	5640
10	GCTAAAGATG CACTACAAG TTTAATGAGT CGCTTAACAA CGTTTTTAGA GCATGCACCTT	5700
	GCAAAGACGA CATCTTTACA TGGTGTTTTA GTAGATGTTT ACGGTGTTGG TGTACTAATT	5760
	ACCGGTGATT CAGGAATAGG TAAAAGTGAG ACTGCGTTGG AATTAGTTAA ACGTGGGCAT	5820
15	AGATTAGTAG CAGATGATAA TGTAAGAAATA CGTCAAATTA ATAAAGATGA ACTAATAGGG	5880
	AAACCACCAA AGTTAATAGA ACATCTATTA GAAATACGTG GACTAGGTAT TATCAATGTT	5940
20	ATGACTTTAT TTGGCGCGGG TTCAATATTA ACTGAAAAC GAATTAGATT AAATATTAAT	6000
	TTGGAAACT GGAACAAGCA AAAGTTATAT GACCGCGTAG GTCTTAATGA AGAGACGCTA	6060
	AGTATTTTAG ATACTGAAAT CACTAAAAA ACAATACCTG TAAGACCTGG TAGAAATGTT	6120
25	GCGGTAATTA TTGAGGTCGC TGCAATGAAC TATCGATTAA ATATCATGGG CATTAAACAG	6180
	GCCGAAGAAT TTAGTGAAAG ATTAAATGAA GAAATTATCA AGAACAGTCA TAAGAGTGAG	6240
	GAGTAGGTTG AATGGGTATT GTATTTAACT ATATAGATCC TGTGGCATT TAACTTAGGAC	6300
30	CACTGAGTGT ACGATGGTAT GGAATTATCA TTGCTGTCGG AATATTACTT GGTTACTTTG	6360
	TTgCACAACG TGCACTAGTT AAAGCAGGAT TACATAAAGA TACTTTAGTA GATATTATTT	6420
	TTTATAGTGC ACTATTTGGA TTTATCGCGG CACGAATCTA TTTGTGATT TTCCAATGGC	6480
35	CATATTACGC GGAAAATCCA AGTGAAATTA TTAAATATG GCATGGTGGA ATAGCAATAC	6540
	ATGGTGGTTT AATAGGTGGC TTTATTGCTG GTGTTATTGT ATGTAAAGTG AAAAAATTAA	6600
	ACCCATTTC AATTGGTGAT ATCGTTGCGC CAAGTATAAT TTAGCGCAA GGAATTGGAC	6660
40	GCTGGGGTAA CTTTATGAAT CACGAGGCAC ATGGTGGATC GGTGTCACGC GCTTTTTTAG	6720
	AACAATTACA TTGCCTAAT TTTATAATAG AAAATATGTA TATTAACGGC CAATATTATC	6780
45	ATCCAACATT CTTATATGAA TCCATTTGGG ATGTCGCTGG ATTTATTATC TTAGTTAATA	6840
	TTCGTAAACA TTAAAATTA GGAGAAACAT TCTTTTTATA TTAACTTGG TATTCAATTG	6900
	GTCGATTCTT TATAGAAGGA TTACGTACAG ATAGCTTAAT GTCACAAGT AATATTAGAG	6960
50	TTGCACAATT AGTATCAATT CTTTTAATTT TAATAAGTAT AAGTTTAATT GTATATAGAA	7020
	GGATTAAGTA TAATCCACCG TTGTATAGCA AAGTTGGGGC GCTTCCATGG CCAACAAAAA	7080

55

EP 0 786 519 A2

	TTATGGCGTG TATACCGTCT TGTAAATTT TCGAAAGTTT TTAAGAATGT AATTATCATT	7200
	GAATTTTCGA AATTTATTC AAGTATGGTA CTGAAAAGAC ATATATATAA ACAACTTTTA	7260
5	AATATTAATA TCGGTAATCA ATCGTCGATA GCTTATAAAG TAATGTTAGA TATTTTTTAC	7320
	CCAGAAGTGA TTACGATTGG TAGTAACAGT GTTATTGGTT ACAATGTAAC AATTTTGACG	7380
	CATGAAGCAT TAGTTGATGA ATTCGTTAT GGACCAGTGA CGATAGGATC TAACACTTTG	7440
10	ATTGGTGCAA ATGCTACCAT TTTACCCGGT ATAACGATTG GTGACAATGT AAAAGTTGCA	7500
	GCTGGTACGG TTGTTTCAAA AGATATACCG GATAATGGAT TTGCATATGG CAACCCTATG	7560
	TATATAAAAA TGATTAGGAG GTGACAATTT TATGGCGCAA AAGAATAATA ATGTAATTCC	7620
15	AATGACTTTT GATGATGCAT TTTATCGTAA AATGGCTAAA CAGAAGTTTA AACAAAGAGA	7680
	ATATAAACGA GCTGCTGAAT ACTTTGAAAA AGTGTTAGAA TTGTCACCTG ATGATCTGGA	7740
20	AATTCAAATT GATTATGCAC AATGTCTAGT GCAACTTGGT ATTGCTAAAA AAGCAGAACA	7800
	TTTATTTTAT GACAATATTA TTTATAATAG GCATCTAGAA GATAGCTTTT ATGAATTGAG	7860
	TCAGCTCAAC ATTGAAGTTA ACGAACCAAA CAAGGCATTC TTGTTTGGTA TTAATTATGT	7920
25	TATTGTTAGC GACGACCAAG ATTATAGAGA TGAATTAGAT CAAATGTTTG ATGTGAAATA	7980
	TCAAAGTGAA GAACAAATTG AACTTGAAGC TCAATTGTTT GTAGTTCAAA TACTATTCCA	8040
	ATATCTTTTT TCTCAAGGTC GATTAAAAGA TGCAAAGAAT TATGTCTTAC ATCAACCACA	8100
30	AGAAGTTCAA GATCATCGTG TAGTACGTAA TTTATTGGCA ATGTGTTATT TATATCTCGG	8160
	TGAATATGAT ACgGCTAAAG CATGTACGA aGCACtATTA CAAGAGGATA GTACaGATAT	8220
	ATATGCATTA TGCCATTATA CTTGCTACT TTATAACACT AAGGAAAATG AACAAATATCA	8280
35	AAAATATTTA AAAATATTAA ACAAAGTTGT ACCTATGAAT GACGATGAAA GTTTTAAATT	8340
	AGGTATTGTA TTAAGTTATT TAAAGCAGTA TCGTGCATCA CAACAATTGT TGTACCCTTT	8400
40	ATATAAAAAA GGGAAATTTT TATCAATTCA AATGTACAAT GCTTTAGCAT ATAATTATTA	8460
	TTATTTAGGT GAAGAAGACG AAAGTCATTA CTACTGGGAT AAATTGAAGC AAATTTCTAA	8520
	AGTGGAAATT GGACATGCGC CTTGGGTAAT TGAAAATAGC AAAGAAGTTT TTGACCAACA	8580
45	TATTTTGCCA TTACTTCAAA GTGATGACAG TCATTATCGT TTATATGGTA TTTTTTTATT	8640
	GGATCAATTA AATGGTAAAG AAATTGTGAT GACGGAAAGT ATTTGGCAGG TTTTGAAAA	8700
	TCTAAATAAT TATGAGAAAT TGTATTTAAC GTATTTAGTT CAAGGTTTAA CGCTCAATAA	8760
50	ATTAGACTTC ATTCATCGCG GCTTATTAAC GCTTTACCAT AATGAATTAT TTGTAAGTGA	8820
	AAATGATGTA ATGTTGTCAT GGATTAATCA AGGTGAAGTC ATAATTGCTG AAAAAGTAGA	8880

55

	TCGAAACGTT ACAAAGAAGC AAATTACAAC ATGGTTAGGC ATAACACAAT ATAAACTGAA	9000
	CAAAATGATT GAATTTCTCT TGAGCATATA GATTATGAA AAGTTAGATT TATTATATAA	9060
5	TGCGCATAAT GATTAATAAT GAGGAGGCGT TAATAAAATG ACTGAAATAG ATTTTGATAT	9120
	AGCAATTATC GGTGCAGGTC CAGCTGGTAT GACTGCTGCA GTATACGCAT CACGTGCTAA	9180
	TTTAAAAACA GTTATGATTG AAAGAGGTAT TCCAGGCGGT CAAATGGCTA ATACAGAAGA	9240
10	AGTAGAGAAC TTCCCTGGTT TCGAAATGAT TACAGGTCCA GATTTATCTA CAAAAATGTT	9300
	TGAACACGCT AAAAAGTTTG GTGCAGTTTA TCAATATGGA GATATTAAAT CTGTAGAAGA	9360
	TAAAGGCGAA TATAAAGTGA TTAACCTTGG TAATAAAGAA TTAACAGCGA AAGCGGTTAT	9420
15	TATTGCTACA GGTGCAGAAT ACAAGAAAAT TGGTGTTCGG GGTGAACAAG AACTTGGTGG	9480
	ACGCGGTGTA AGTTATTGTG CAGTATGTGA TGGTGCATTC TTTAAAAATA AACGCCTATT	9540
	CGTTATCGGT GGTGGTGATT CAGCAGTAGA AGAGGGAACA TTCTTAACTA AATTTGCTGA	9600
20	CAAAGTAACA ATCGTTCACC GTCGTGATGA GTTACGTGCA CAGCGTATTT TACAAGATAG	9660
	AGCATTCAAA AATGATAAAA TCGACTTTAT TTGGAGTCAT ACTTTGAAAT CAATTAATGA	9720
25	AAAAGACGGC AAAGTGGGTT CTGTGACATT AACGTCTACA AAAGATGGTT CAGAAGAAAC	9780
	ACACGAGGCT GATGGTGTAT TCATCTATAT TGGTATGAAA CCATTACAG CGCCATTTAA	9840
	AGACTTAGGT ATTACAAATG ATGTTGGTTA TATTGTAACA AAAGATGATA TGACAACATC	9900
30	AGTACCAGGT ATTTTTCAG CAGGAGATGT TCGCGACAAA GGTTTACGCC AAATTGTCAC	9960
	TGCTACTGGC GATGGTAGTA TTGCAGCGCA AAGTGCAGCG GAATATATTG AACATTTAAA	10020
	CGATCAAGCT TAATTCGAAG TCGAATTAAAG ATGTTGAGCT GTAAATTATT TGGATATTTA	10080
35	TTTAAATAGT GTCATCACAG CGTTAAAATA ATGTCTTACT TTTAAATTAA AGCAAATTAT	10140
	ATAGAAAAC AGAACTTAGT ACGTATCATT TGTGCGTTTC AATGAGTTCT AGTTTTTTTA	10200
	TATGTTATAT TAAACTTATA ACTTTATGGG AGTGGGACAG AAATGATAAA GAGCCACTAA	10260
40	TGATTTATTA TGTAGTGGTT CTTAAACATT AGCCACAGCT AATGTGTACT TAAAAATAGG	10320
	AATACATGAG TAAAACTCAT GCATAAGAAA TACTAATTTT TATAGAAAAA GTATTACTTT	10380
	ATCGTTGTCC CACCCCAACT TGCACATTAT TGTAAGCTGA CTTCCGCCA GCTTCTGTGT	10440
45	TGGGGCCCCG CCAACTTGCA CATTATTGTA AGCTGACTTT TCGTCAGCTT CTGTGTTGGG	10500
	GCCCCGCCAA CTTGCACATT ATTGTAAGCT GACTTTTCGT CAGCTTCTGT GTTGGGGCCC	10560
50	CGCCAACTTG CATTGTCTGT AGAAATTGGG AATCCAATTT CTCTATGTTG GGGCCACAC	10620
	CCCAACTCGC ATTGCCTGTA GAATTTCTTT TCGAAATTCT CTGTGTTGGG GCCCACACCC	10680

55

EP 0 786 519 A2

	ACTCGCATTG CCTGTAGAAT TTCTTTTCGA AATTCTCTGT GTTGGGGCCC CTGACTAGAG	10800
	TTGAAAAAAG CTTGTTGCAA GCGCATT TTC ATTCACTAGCAA TATAATATTA	10860
5	TAGACCCTAG GACATTGATT TATGTCCCAA GCTCCTTTTA AATGATGTAT ATTTTITAGAA	10920
	ATTTAATCTA GACATAGTTG GAAATAAATA TAAAACATCG TTGCTTAATT TTGTCATAGA	10980
	ACATTTAAAT TAACATCATG AAATTCGTTT TGGCGGTGAA AAAATAATGG ATAATAATGA	11040
10	AAAAGAAAAA AGTAAAAGTG AACTATTAGT TGTAACAGGT TTATCTGGCG CAGGTAAATC	11100
	TTTGGTTATT CAATGTTTAG AAGACATGGG ATATTTTTGT GTAGATAATC TACCACCAGT	11160
	GTTATTGCCT AAATTTGTAG AGTTGATGGA ACAAGGAAAT CCATCCTTAA GAAAAGTGGC	11220
15	AATTGCAATT GATTTAAGAG GTAAGGAACT ATTTAATTCA TTAGTTGCAG TAGTGGATAA	11280
	AGTCAAAAGT GAAAGTGACG TCATCATTGA TGTATGTTT TTAGAAGCAA GTACTGAAAA	11340
	ATTAATTTCA AGATATAAGG AAACGCGTCG TGCACATCCT TTGATGGAAC AAGGTAAAAG	11400
20	ATCGTTAATC AATGCAATTA ATGATGAGCG AGAGCATTG TCTCAAATTA GAAGTATAGC	11460
	TAATTTTGTT ATAGATACTA CAAAGTTATC ACCTAAAGAA TTAAAAGAAC GCATTCGTGC	11520
25	ATACTATGAA GATGAAGAGT TTGAACTTT TACAATTAAT GTCACAAGTT TCGGTTTTAA	11580
	ACATGGGATT CAGATGGATG CAGATTTAGT ATTTGATGTA CGATTTTAC CAAATCCATA	11640
	TTATGTAGTA GATTTAAGAC CTTTAACAGG ATTAGATAAA GACGTTTATA ATTATGTTAT	11700
30	GAAATGGAAA GAGACGGAGA TTTCTTTGA AAAATTAATC GATTGTTAG ATTTTATGAT	11760
	ACCCGGGTAT AAAAAAGAAG GGAAATCTCA ATTAGTAATT GCCATCGGTT GTACGGGTGG	11820
	ACAACATCGA TCTGTAGCAT TAGCAGAACG ACTAGGTAAT TATCTAAATG AAGTATTTGA	11880
35	ATATAATGTT TATGTGCATC ATAGGGACGC ACATATTGAA AGTGGCGAGA AAAAATGAGA	11940
	CAAATFAAAG TTGTACTTAT CGGTGGTGGC ACTGGCTTAT CAGTTATGGC TAGGGGATTA	12000
40	AGAGAATTCC CAATTGATAT TACGGCGATT GTAACAGTTG CTGATAATGG TGGGAGTACA	12060
	GGGAAAATCa GAGATGAAAT GGATATACCA GCACCAGGAG ACATCAGAAA TGTGATTGCA	12120
	GCTTTAAGTG ATTCTGAGTC AGTTTTAAGC CAACTTTTTC AGTATCGCTT TGAAGAAAAT	12180
45	CAAATTAGCG GTCACCTATT AGGTAATTTA TTAATCGCAG GTATGACTAA TATTACGAAT	12240
	GATTTCCGAC ATGCCATTAA AGCATTAAAGT AAAATTTTAA ATATTAAAGG TAGAGTCATT	12300
	CCATCTACAA ATACAAGTGT GCAATTAAAT GCTGTTATGG AAGATGGAGA AATTGTTTTT	12360
50	GGAGAAACAA ATATTCCTAA AAAACATAAA AAAATTGATC GTGTGTTTTT AGAACCTAAC	12420
	GATGTGCAAC CAATGGAAGA AGCAATCGAT GCTTTAAGGG AAGCAGATTT AATCGTTCTT	12480

55

GCGTTAATTC ATTCTGATGC GCCTAAGCTA TATGTTTCTA ATGTGATGAC GCAACCTGGG 12600
 GAAACAGATG GTTATAGCGT GAAAGATyAT ATCGATGCGA TTCATAGACA AGCTGGACAA 12660
 5 CCGTTTATTG ATTATGTCAT TTGTAGTACA CAAACTTTCA ATGCTCAAGT TTTGAAAAAA 12720
 TATGAAGAAA AACATTCTAA ACCAGTTGAA GTTAATAAGG CTGAACCTGA AAAAGAAAGC 12780
 ATAAATGTAA AAACATCTTC AAATTTAGTT GAAATTTCTG AAAATCATT AGTAAGACAT 12840
 10 AATACTAAAG TGTTATCGAC AATGATTTAT GACATAGCTT TAGAATTAAT TAGTACTATT 12900
 CCTTCGTAC CAAGTGATAA ACGTAAATAA TATAGAACGT AATCATATTA TGATATGATA 12960
 ATAGAGCTGT GAAAAAATG AANATAGACA GTGGTTCTAA GGTGAATCAT GTTTTAAATA 13020
 15 AGAAAGGAAT GACTGTACGA TGAGCTTTGC ATCAGAAATG AAAAATGAAT TAACTAGAAT 13080
 AGACGT 13086

(2) INFORMATION FOR SEQ ID NO: 17:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 1350 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 25 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

30 CATTAGTCAT GAAATAGCC GACAACTTCA TCTGTGAAAT CACCGGCCTT TTATTTTAGC 60
 TAACTTTATT TCTGATTTTA CGATTTTAAT TGATCATACA GAGAAAGTGA TCTTTTACAA 120
 ATTTCTAAAA ACTCATGATC TATATTGGAC ATTTGATGAA AATAAGACAA AATGTTTTCT 180
 35 GTTAGCTTCT CTTGTTTTGG GAATGAATCA TCTTCTTTAA TCCAAATCGC TAATTCGCCT 240
 AATGTTGTTT TATCATCTTT AAATGTTTGT ATATATTCGT AAAAGCTCAT AGTATTCCTT 300
 CTCTCAATTT ACTTATATAA ATCCTACCAC GAAAGCTTTC AAGAAAACAC AATTAAATGT 360
 40 CTATTTAGTG AACTTTTTAA GGTGTGTCAC TCTTTTAATG TCTGCCAATT AGGTCAATTA 420
 ATCATCACAA TGTACAATTA ACTCTATTTT CAGTTCATAT ACTCACACAC CGTTTTTGAA 480
 45 CAACACATTA ACTTCTCATT TAGATAAAAC GCAAAAAAGC CTGGCACCAA TACAATAGAT 540
 GCCAGACTAA GAGTCTACTA TATAAATTTA TTTAGCGTAT GGTTTTACTT CGATTGCACC 600
 TTCATTTTCA TCATGAACAC CATGCTTATA ATAATCAATA TATTGTGGCT CTAAAGGCTT 660
 50 TCTGCCACGT ATAATGTCTG CTGCTTTTTC AGCTAACATT AAAACAGGTG CGTGTATATT 720
 GCCATTTGTC GTACGTGGCA TAGCTGATGC ATCAACTACA CGTAAATTTT CCATACCGTG 780

EP 0 786 519 A2

ACTACAAGAT GGGTGTAAATG CTGTTTCACC ATCTCTACGA ACCCAATCAA GAATTTCTTC 900
 GTCTGTTTGC ACTTCTGGTC CTGGTGAAAT TTCTCCACCA TTGAATGGAT CCATTGCTTT 960
 5 TTGAGATAAG ATATTTCTTG CTACACGAAT TGCTTCTACC CATTCTTTTT TATCTTCTTC 1020
 TGTGATAAAA TAATTAAAGC GGATACTTGG TTTTTCGAAT GGATCTTTAG ATTTGATTTT 1080
 CAAGCTACCA CGAGAGTTTG AATACATTGG TCCTACGTGA ACTTGATAAC CATGTGCGAC 1140
 10 CGCTGCCTTT TGACCATCAT ATCTTACAGC TATTGGTAAG AAATGGAACA TTAAGTTAGG 1200
 ATAAtCAACT TCGTTATTTG AACGTACAAA TCCGCCACCT TCAAAATGGT TAGATGCTGC 1260
 15 TGCACCTGTA CGTGTGAAAA TCCATTGTAA ACCAATAAAT GGcATGCGCT TGAtAtCTAA 1320
 GCTTGGCtGt AATGATACAG GTTCCTTACA 1350

(2) INFORMATION FOR SEQ ID NO: 18:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 1376 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

TAATGCTATT GGCAACACCA TATATGAAAa CTCCAAACGA TCCTAAACCG ACTATAGATT 60
 30 CACCAAATTT nACAATCCAT GAATAAAGTA GTGGCCATAA GAATAACAAT ATGACAACCTA 120
 AAAATGTACA GTAAAATGCA GTCATAATTG GAACTAGACG TTTACCACTA AAAAATGATA 180
 35 ATGCTAATGG TAATTCTGTT TCACTAAACT TATTGTATGC ATAAGCTGCT ATTAAACCTA 240
 TTACAATACC AACAAAGACA TTGCCATTAT TCATCTTTTC AAAAGCTGAA TTTATTTCCG 300
 ArGCTTTTCAT TCCTAATAAA GGCGCTAATT TCATTGGTGA TAATACAACT GTAACATAAA 360
 40 AATATCCTAA CGTrGCTGCA rGCGsGACTG CACCATCATT TTCTTTTGCC ATTCTATAG 420
 CTACACCAAT TGCAAATAAA ATACCTAATT GCTCTAAAAT CGTAGTACCT ACCGTAGTAA 480
 AGAACATTGC GATTTTCGGC GTCGCATGAA GTGCATTAA CGTATTACCA ATTCGGCAA 540
 45 TAATGCTGC AGCCGGTAAA ATGGCAACTG GTAACATTAA CGAACGCCCT AAATTTTGGA 600
 AAAATTTATA CATTGAATGT CATCCTTCTT AAAATAATGT AGAAATATAA AGATTACTAA 660
 TGTAAGTAGA ATAACACTT CGATACTCCG TTATAGTCAC CTAGGCTTAC TAACCAGCTA 720
 50 TATTTCTACC TCAAGTTATT TTATAAACTT TTTACAATTT CATGCAATTC TTGTTGTAAC 780
 TTTGCTGTTT GTGTTTCAAT CTCTTTTGTA ATATAATCGA TACGCTCGTT TCGTTTTAAA 840

AAAGACCGTG AATCTTAGTA GGACCAACAT AAGCAACAGG TAATATTGGT GACTTACTTA 960
 ACATTGCAAT TGTTGAAGCA CCaCGTTTCA AAGGTGCACC TTCTTGCGAT GTGCGAGAAC 1020
 5 CTGTTGGGAA GATACCAACT GTCTTATTAT CTTTCAACAA ATTGATTGGG CGTTTTAAAG 1080
 TACTAGGTCC TGGATTTTCA CGATCTACAG GAAATGCATT TAAAGACGTT AAAAAATTAC 1140
 CAATCCATTT ATTTTGAAT AATTCTTTTT TAGCCATATA ATGAATTTGA TTAGGATATA 1200
 10 ATGCCATACC TAGCATAATG ACTTCGTTAT AACTTTCATG CGTACAAGTT ACGACATATT 1260
 TACTATCCTT AGGAATATTA TCTTTACCGA TTACGTATAA TGATTTTGAC ATTTTAACTA 1320
 AAATGAAATT CAAAATCTTA CTAATCACTG AATACATTGT GCCACCTACT TAACTT 1376
 15

(2) INFORMATION FOR SEQ ID NO: 19:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 7363 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19:

TTGTCATACC AATATTTTGT AAAATATGGA ACACAAGTAA AGTGACGAAA CCAACGATAA 60
 AGATTTTGTT AAATTGATCT TCAATTTTCG CAGCTAATCT TATTAGATGG AAGATTAAAA 120
 30 ATAAAAATAT TAAGATCAAT ATGACAGAAC CGATAAAGCC AAGTTCCTCT CCAATCACTG 180
 AAAAGATAAA GTCAGTATGA TTTTCAGGTA TATAAAGTTC ACCGTGATTG TATCCTTTAC 240
 CTAGTAACTG TCCAGAACCG ATAGCTTTAA GTGATTGAGT TAAATGaTAG CCATCACCAC 300
 35 TACTATATGT ATAGGGGTCA AGCCATGAAT TGATTGCTCC CATTGATAC AGTTGGaCAC 360
 CTAATAAATT TTCAATTAAT GCGGGTGCAT ATAGaATACC TAAATGACT GTCATTGCAC 420
 CAACaATACC TGTAATAAAG ATAGGTGCTA AGATACGCCA TGTATACCA CTTACTAACA 480
 40 TCACACCTGC AATAATAGCA GCTAATACTA ATGTAGTTCC TAGGTCATTT TGCAGTAATA 540
 TTAAATACT TGGTACTAAC GAGACACCAA TAATTTTGAA AAATAATAAC AAATCACTTT 600
 GGAATGATTT ATTGAATGTG AATTGATTAT GTCTAGAAAC GACACGCGCT AATGCTAAAA 660
 45 TTAAATAAT TTTCATGAAT TCAGATGGCT GAATACTGAT AGGGCCAAAC GTGTACCAAC 720
 TTTTGGCACC ATTGATAATA GGTGTAATAG GTGACTCAGG AATAACGAGC AAGCCTATTA 780
 50 ATAATAGACA GATTAAGAAA TACAATAAAT ATGTATAATG TTAAATCTTT TTAGGTGAAA 840
 TAAACATGAT GATACCTGCA AAAATTGCAC CTAAATGTA ATAAAAAATT TGTCTGATAC 900

	TTGCTAAAAC AGCTATAGTG GCTACTAATA CCCAGTCTAC TTTGCGAaNC aATGCTTATC	1020
	CGGCTGTTGA CGAGATGAAT AATTCATTGC AAATCCTTT TATACTCACT AATGTTTATA	1080
5	TCAATTTTAC ATGACTTTTT AAAAATTAGC TAGAATATCA CAGTGATATC AGCTATAGAT	1140
	TTCAATTGTA ATTAGGAATA AAATAGAAGG GAATATTGTT CTGATTATAA ATGAATCAAC	1200
	ATAGATACAG ACACATAAGT CCTCGTTTT AAAATGCAAA ATAGCATTAA AATGTGATAC	1260
10	TATTAAGATT CAAAGATGCG AATAAATCAA TTAACAATAG GACyAAATCA ATATTAATTT	1320
	ATATTAAGGT AGCAAACCCT GATATATCAT TGGAGGAAAA CGAAATGACA AAAGAAAATA	1380
15	TTTGTATCGT TTTTGGAGGG AAAAGTGCAG AACACGAAGT ATCGATTCTG ACAGCACAAA	1440
	ATGTATTAAA TGCAATAGAT AAAGACAAAT ATCATGTTGA TATCATTTAT ATTACCAATG	1500
	ATGGTGATTG GAGAAAGCAA AATAATATTA CAGCTGAAAT TAAATCTACT GATGAGCTTC	1560
20	ATTTAGAAAA TGGAGAGGCG CTTGAGATTT CACAGCTATT GAAAGAAAGT AGTTCAGGAC	1620
	AACCATACGA TGCAGTATTC CCATTATTAC ATGGTCCTAA TGGTGAAGAT GGCACGATTC	1680
	AAGGGCTTTT TGAAGTTTTG GATGTACCAT ATGTAGGAAA TGGTGTATTG TCAGCTGCAA	1740
25	GTTCTATGGA CAAACTTGTA ATGAAACAAT TATTTGAACA TCGAGGGTTA CCACAGTTAC	1800
	CTTATATTAG TTTCTTACGT TCTGAATATG AAAAATATGA ACATAACATT TTAAAATTAG	1860
	TAAATGATAA ATTAAATTAC CCAGTCTTTG TTAACCTGC TAACTTAGGG TCAAGTGTAG	1920
30	GATCAGTAA ATGTAATAAT GAAGCGGAAC TTAAGAAGG TATTAAAGAA GCATTCCAAT	1980
	TTGACCGTAA GCTTGTTATA GAACAAGGCG TTAACGCACG TGAAATTGAA GTAGCAGTTT	2040
	TAGGAAATGA CTATCCTGAA GCGACATGGC CAGGTGAAGT CGTAAAAGAT GTCGCGTTTT	2100
35	ACGATTACAA ATCAAAATAT AAAGATGGTA AGGTTCAATT ACAAATTCCA GCTGACTTAG	2160
	ACGAAGATGT TCAATTAACG CTTAGAAATA TGGCATTAGA GGCATTCAAA GCGACAGATT	2220
	GTTCTGGTTT AGTCCGTGCT GATTTCTTTG TAACAGAAGA CAACCAAATA TATATTAATG	2280
40	AAACAAATGC AATGCCTGGA TTTACGGCTT TCAGTATGTA TCCAAAGTTA TGGGAAAATA	2340
	TGGGCTTATC TTATCCAGAA TTGATTACAA AACTTATCGA GCTTGCTAAA GAACGTCACC	2400
45	AGGATAAACA GAAAAATAAA TACAAAATTG ACTAACTGAG GTTGTTATTA TGATTAATGT	2460
	TACATTAAAG CAAATTCAAT CATGGATTCC TTGTGAAATT GAAGATCAAT TTTTAAATCA	2520
	AGAGATAAAT GGAGTCACAA TTGATTCACG AGCAATTTCT AAAAATATGT TATTTATACC	2580
50	ATTTAAAGGT GAAATGTTG ACGGTCATCG CTTTGTCTCT AAAGCATTAC AAGATGGTGC	2640
	TGGGGCTGCT TTTTATCAAA GAGGGACACC TATAGATGAA AATGTAAGCG GGCCTATTAT	2700
55		

EP 0 786 519 A2

	AAACCCTAAA GTAATTGCCG TCACAGGGTC TAATGGTAAA ACAACGACTA AAGATATGAT	2820
	TGAAAGTGTA TTGCATACCG AATTTTAAAGT TAAGAAAACG CAAGGTAATT ACAATAATGA	2880
5	AATTGGTTTA CCTTTAACTA TTTTGGAAAT AGATAATGAT ACTGAAATAT CAATATTGGA	2940
	GATGGGGATG TCAGGTTTCC ATGAAATTGA ATTTCTGTCA AACCTCGCTC AACCAGATAT	3000
10	TGCAGTTATA ACTAATATTG GTGACTCACA TATGCAAGAT TTAGGTTTCGC GCGAGGGGAT	3060
	TGCTAAAGCT AAATCTGAAA TTACAATAGG TCTAAAAGAT AATGGTACGT TTATATATGA	3120
	TGGCGATGAA CCATTATTGA AACCACATGT TAAAGAAGTT GAAAATGCAA AATGTATTAG	3180
15	TATTGGTGTT GCTACTGATA ATGCATTAGT TTGTTCTGTT GATGATAGAG ATACTACAGG	3240
	TATTTTCATTT ACGATTAATA ATAAAGAACA TTACGATCTG CCAATATTAG GAAAGCATAA	3300
	TATGAAAAAT GCGACGATTG CCATTGCGGT TGGTCATGAA TTAGGTTTGA CATATAACAC	3360
20	AATCTATCAA AATTTAAAAA ATGTCAGCTT AACTGGTATG CGTATGGAAC AACATACATT	3420
	AGAAAATGAT ATTACTGTGA TAAATGATGC CTATAATGCA AGTCCTACAA GTATGAGAGC	3480
	AGCTATTGAT ACACTGAGTA CTTTGACAGG GCGTCGCATT CTAATTTTAG GAGATGTTTT	3540
25	AGAATTAGGT GAAAATAGCA AAGAAATGCA TATCGGTGTA GGTAATTATT TAGAAGAAAA	3600
	GCATATAGAT GTGTTGTATA CGTTTGGTAA TGAAGCGAAG TATATTTATG ATTCGGGCCA	3660
	GCAACATGTC GAAAAAGCAC AACACTTCAA TTCTAAAGAC GATATGATAG AAGTTTTAAT	3720
30	AAACGATTTA AAAGCGCATG ACCGTGTATT AGTTAAAGGA TCACGTGGTA TGAAATTAGA	3780
	AGAAGTGGTA AATGCTTTAA TTTCATAGAG ATTAGTCGAG GGACCTTTTA CTTATAAAAA	3840
	TGATTTGAAT TAATACTAAA AGATTACAAA GAAGAGGTGG TTTTGTGTGT AAATACAAAA	3900
35	TTGCCTTTTT CTTTTTATGT TAAATCTATA AATTTGAAAC TAAATCAAGG TTAATTCTAT	3960
	GTACACACTT TATATAGGAA GTAGTTTGAA TGTTTATATA ATGTTTACAA AAAAGATGTA	4020
	GTATTATAAT GTCTAATTTT ACATGTGTTT CAGTAAATTT TGTGTGGAA TGTTAACGAT	4080
40	ATACGTATTT TATAAAAaAT TTTTATAAT GATTATTCGA ATGATGCGTA ACGCTTACAT	4140
	CTTATCTAAT GCTAGCTTTT TGACAAAAAT ATGACAATCA ATTAATGTGA TTCTAATAAA	4200
45	TATTCGCAAA TTGCTTTATT GCGATTAAAT TTTTTTGGTG GTACTATATA GAAGTTGATG	4260
	AAATATTAAT GAACCTATAT GCAAAAAGTAT ATTGAGAAAT AACAGGTAA AAAGGAGAAT	4320
	TATTTTGCAA AATTTTAAAG AACTAGGGAT TTCGGATAAT ACGGTTCACT CACTTGAATC	4380
50	AATGGGATTT AAAGAGCCGA CACCTATCCA AAAAGACAGT ATCCCTTATG CGTTACAAGG	4440
	AATTGATATC CTTGGGCAAG CTCAAACCGG TACAGGTAAA ACAGGAGCAT TCGGTATTCC	4500

55

EP 0 786 519 A2

	AGAATTGGCA ATGCAGGTAG CTGAACAATT AAGAGAATTT AGCCGTGGAC AAGGTGTCCA	4620
	AGTTGTTACT GTATTCGGTG GTATGCCTAT CGAACGCCAA ATTAAAGCCT TGA AAAAAGG	4680
5	CCCACAAATC GTAGTCGGAA CACCTGGGCG TGTATCGAC CATTTAAATC GTCGCACATT	4740
	AAAAACGGAC GGAATTCATA CTTTGATTTT AGATGAAGCT GATGAAATGA TGAATATGGG	4800
10	ATTCATCGAT GATATGAGAT TTATTATGGA TAAAATTCCA GCAGTACAAC GTCAAACAAT	4860
	GTTGTTCTCA GCTACAATGC CTAAAGCAAT CCAAGCTTTA GTACAACAAT TTATGAAATC	4920
	ACCAAAAATC ATTAAGACAA TGAATAATGA AATGTCTGAT CCACAAATCG AAGAATTCTA	4980
15	TACAATTGTT AAAGAATTAG AGAAATTTGA TACATTTACA AATTTCTTAG ATGTTTCATCA	5040
	ACCTGAATTA GCAATCGTAT TCGGACGTAC AAAACGTCGT GTTGATGAAT TAACAAGTGC	5100
	TTTGATTTCT AAAGGATATA AAGCTGAAGG TTTACATGGT GATATTACAC AAGCGAAACg	5160
20	TTtAGAAGTA TtanAGAAAT TTA AAAATGA CCAAATTAAT ATTTTAGTCG CTA CTGATGT	5220
	AGCAGCaAGA GGA CTAGATA TTTCTGGTGT GAGTCATGTT TATAACTTTG ATATACCTCA	5280
	AGATACTGAA AGCTATACAC ACCGTATTGG TCGTACGGGT CGTGCTGGTA AAGAAGGTAT	5340
25	CGCTGTAACG TTTGTTAATC CAATCGAAAT GGATTATATC AGACAAATTG AAGATGCAAA	5400
	CGGTAGAAAA ATGAGTGCAy TcGTCCACCA CATCGTAAAG AAGTACTTCA AGCACGTGAA	5460
	GATGACATCA AAGAAAAAGT TGAAA ACTGG ATGTCTAAAG AGTCAGAAATC ACGCTTGAAA	5520
30	CGCATTTCTA CAGAGTTGTT AAATGAATAT AACGATGTTG ATTTAGTTGC TGC ACTTTTA	5580
	CAAGAGTTAG TAGAAGCAAA CGATGAAGTT GAAGTTCAAT TAACTTTTGA AAAACCATTA	5640
	TCTCGCAAAG GCCGTAACGG TAAACCAAGT GGTCTCTGTA ACAGAAATAG TAAGCGTGGT	5700
35	AATCCTAAAT TTGACAGTAA GAGTAAACGT TCAAAAGGAT ACTCAAGTAA GAAGAAAAGT	5760
	ACA AAAAAAT TCGACCGTAA AGAGAAGAGC AGCGGTGGAA GCAGACCTAT GAAAGGTCGC	5820
40	ACATTTGCTG ACCATCAAAA ATAATTTATA GATTAAGAGC TTAAAGATGT AATGTCTTGA	5880
	GCTCTTTTTT GTTTTCAATA ATTGATTCTC TG TAGATATC aaAGTaCTAA CGTTTTAAAG	5940
	GTTAAATATT TAATTGGATT GAGATCTGTA TGCGGTTATA TCaTTCTGTG TAAATATGGT	6000
45	TCTCCACCAA ATGTGGTGAG TATATAATTT AAAGAACTAT TTTTAAATTA AGAATAATCG	6060
	AACATAAATA AACTTTATGA AATTT CAGTA TCATGTTCTT ATAAAAACA ATAGGGCTTT	6120
	TTGctGACGC TAGTGCGCGA TAAATAATAA GTTGAATATA AAAAAGATCA CTGCCAATCA	6180
50	TTCGTTTAAT GGCAGCGATC TTTTTTATTT AATTATTTCT CTTTCCACTG CAACATTTGA	6240
	TAACCAATGC GTGGATGTGT TTTAATAATA TCTTTTTCGT CCTCATGACA TTGTGAAAGT	6300

55

CCATATATTC GTTTTAATAT CATCTCATAA GTGAGTACTT TTCCTTTATG ATTTGACAAT 6420
 AGTTCTAACA AGCTAAATTC ATTTGGCGTC AAATGTACCT CCTGATTATT AATAACAACA 6480
 5 GATTTGGAGC CAAAGTCGAT GCTTAGCAAA CCGTTAGTAA ATACAATGTT AGTTTCTTGA 6540
 TGTGACTTAG CGATTCTCTC GATGACTCGT ATTCGTGCCC GAAGCTCATC AACATTAAAA 6600
 GGTTTAGTCA TATAGTCATT CGCACCCTTA TCTAAAGCTT GAATAATTGT TTGTTCTTCT 6660
 10 TGTCTTGCAC TTATTACAAT GATAGGAATG TCAGTATGTT GCCTGATTTC TGAATCAAA 6720
 CATAATCCAT CTTTATCTGG TAAACCTAAA TCTAATAAAA TGACATCTGG TTTATCAATT 6780
 TGAATTTTAA AGTGTGCTTG TGTGGCATTG TCGGCTGTAG TTACATTGTA ATAATCTAAA 6840
 15 GTTAATGCAA CATCAAGTAA ATGTGTGATT GCGTGATCAT CTTCAATTAT CAATATTTTA 6900
 GATTGCATTA TACGTCTCCT TCGTTAAAGT CTGTATATAT ATTGAAATAG AATATACTGC 6960
 20 CGTGTGGTTG GTTCGGTTTA TATTGTAAGT TTGATTGATG TTTGTGTAGG ATAGTCTGTA 7020
 CTAATATAAA GCCTAGTCCC ATGCTTTCTT TTTGGTTATC TTTAAAATAT TTATTTGATC 7080
 CTGTGTAAAA AGGCTCGAAT ATCTTTTGTt GTTCTTCTAA ACTAATTCCA GGTCTTCTGT 7140
 25 CTATAACGGC AAATTCGATT TGTTCATAGC TAGCATAACG AATAGATAAA TTGATTTTGG 7200
 TGTCAGTAGA AGTGTGTTTA ACTGCATTTT CAATCAAATT GAAtAAAgCT TGTAAATCA 7260
 ACTTACTGTC AATGTGTATA AAcTGAAAT TTA CTGAGGA TGATACAGTT ATACGCTTTT 7320
 30 TTAAATGGCG ACGTTCTAAA ATACATATCG ATTTCTTATA CTA 7363

(2) INFORMATION FOR SEQ ID NO: 20:

(i) SEQUENCE CHARACTERISTICS:
 35 (A) LENGTH: 10470 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

TTAACAATCG ATAACCACAA TACTTCTATT GTAATTGTTT AACGATTTCn CGATTAAAAAT 60
 45 CATCTAAATC GTCTGGTACT CGACTTGTTA CAATATTGTT GTCTACAcTa CTGACTCATC 120
 AACTACATGT GCGCCTGCAT TTGATAAATC TTTGCGTACA TTTAATACTG CTGTTAACGT 180
 ACGACCTTTT AAATCGTCTG TATCTATTAG TATTTGTGGC CCATGACAAA TGGCAAATGT 240
 50 TGGTACATCA TTTTAGTAA AGTATTTAGC AAATGTGCCA TATCGACCTT CTGTATCTCC 300
 ACGTAAATGA TCTGGTGAAG ATCCTCCAGG AATTAATAAT GCATCATAAT CTTCTGGTTT 360

55

EP 0 786 519 A2

	ATTTGCAGTA TCTCCAATCA CTACAGTATT AAAGCCTGCA TTCTCTAATG CCTCTTTAGG	480
	GCTTGAATAT TCTATATCTT CAAATTCGTT TGCTAGAATA ATTGCTACTT TTTTAGTCAT	540
5	TGAAAATCAC CTTTCTATAT ATCATTGATA TAATTACTAT AGACAAGTAA ATCAGTGATT	600
	AAACATACAA GATATAAAAA ATATTAAGCG ACTGTCGCGA TATCTAACCC TAACACATCT	660
10	TATGTGGCAT TTACTTAGAT ACTAATTAA CCTTTTCTTC AAGCTGATCT AACAAATCCAA	720
	TCCATTCATC TATATCTTCA ACACGTACTT CATCAGGATT TACATGATCG ATATCCTCAA	780
	TAAACTTATT TAAACGCGCT TTTATCTGTT CGATTGTTTG CTGTTCAITC ATAAAAAGTT	840
15	AACTCCTTTT ATTTTGT TTTTTCATT ATTATCCTAA CAGAAATTGC GTTAAAGCGA	900
	TATAATCTTA GCTATATTTA TGACATTCAA ATTATTTTGA CTTTAAAAA TCCCCTTTTC	960
	AATTAATAA AATTAAGAGA TAATTTGTTA CGAGTGATAA TACGAaGkGG TaTCATACCG	1020
20	ATATGAACCA AATAGAAAGA AGGAAGTTA AGACGATGAA TAGCGTCAA TTGAAGCAAC	1080
	CTGTTAGCAT TTACAATGAT CCATGGGAAG TGAAATTTAT ATACATTTAA ATTTTCATGAG	1140
	ACAATAAACG TTGATTTAAT GCGTTTTTTT GCCTTTTTTA TTTTCCTTAT TTTTCTGTT	1200
25	TTACAACAAA ATGGTATCAA AAATGGTATC ATTTGTAGTT ATTTTAGCTT CACATATTAA	1260
	AACAACCACA CTCCTAAATT AATAGGTGGT GTGGTTTTGT TGGTTGTGTG GGGATAAAAA	1320
	TAACCGCATC AGTTAAGATG CGGTTATCTA GCAAGGGCCA CGTATTTATA AATACGTTTA	1380
30	GAATCTCTTC GGCAACTTTG CTATAGACAG TCTATGCTGT TACTAAATTA TACCACCACA	1440
	CAAACCTACT CCCATTGAGG AACACAGAGC TTTGTGCTC GTCAGCAACG TCATATGAAT	1500
	TCTCAGTTCA TGTGTGGTG ACACTTTAAA CGGTCTGTGC CAGTAGCGAC CGAGTCATTT	1560
35	CAAGAATGAC CATTTACAT TTATATTATA ACACTTGTCG TGCCTAACTG TATAGTTTTT	1620
	CAGTTGTATT TAAAGTTAAG TTATCTACTT CGCGCTTCC TTGCCTTAAT TGTGAAATTA	1680
	CATATTGCGC TACGCCAGTT TGTTTGTGAA TTTGTTAACC TGTTATATCA CTTTTGATCA	1740
40	ATTCAATTAT TTTAATTTA TAATCACTCA TATTATCTAC GTCCATTCTT TTTATCTAAA	1800
	CAATAAAAAAT GTGTCTTTCT CCCGATAAAT AATAACAATG GTAGGCTTAA TAAAAACAAT	1860
45	ATTAAATACA TTTGTTCTGT CATAATTGAA AACCTCCAAA TAATATTATA TTATATAAGT	1920
	GTAAGGAGGA GCCATCAGGC TCCAAGCATA ATGTTAATCT TTGTTGTTTG GCTTTCGGTC	1980
	TAGGTAGCCG AGATGCCaTT CTCTAAGTTG TTTTAACACT TCTGGAATTA TCAGTACTGC	2040
50	CAATACTTGA TGTTCTAGAA GTGTTTTTAT TATGTCTAGC ATGAGGCTTT TCACCTCCTT	2100
	ACACATAATT TGTAAGTCAT CAACTAACCT ACAAATATAA TTATACTAAA CAAATGTTTA	2160

55

	GTATCTACA TTAAATCTT GAGAGAAATG TTA AAAAGTT CTAGTAAAAT AATAGCACAT	2280
	TTTATCTTTA AATGTAAATA GAAAGCAGGT ATGTAACGCA CCTGCTTAAA TAGaCATGAC	2340
5	TATGTCATTC TAACTGATTT CTCCCCATAA GTCACCTAAT ATCTGATTAG GTGGGGCAGA	2400
	ACCATTCCAT GTTCTAATAG GCAAGTAATA ACGTTGCCCC TCCCATGTAT ATCCTACCCA	2460
	AACATGACCA TCTGTAAACA TCACTTCTGT ATAATCACAA TACCCACCAG GTTGGAACTG	2520
10	ATAACCCACT GGACAAGATA AGAATGGCCC CACTTTTCTT ACTGTGATTG GTTGATTGCC	2580
	GTTTGTGAAT CTAGCACTTT CTTCCATGTA GTAAGTACCA TATTTATTAC GTTTCCATGC	2640
15	ACTTGCAACT GGTTTAACTG TATTACTTGA AGCGCTTGAC TCATTAGAGA CAGTGGCAAC	2700
	CGGTATTTTA CCATCCATGT ACGCCCTAAT CTGCTTGATA AAGTAGTCTT TAAGTTGCAA	2760
	CCGCTTGTCT TCTGGCAATA GACCGCGAGT TACTGGGTCA AAACCAGTGT GTAAAACCGA	2820
20	ACTTCTATGA GGGCATGATG TTGAAGTAAA TTCATTGTGC AATCTGATTG TATTTCTGTT	2880
	TGCTGGTAAT CCCCATTTTT TCAACAATCT AGCGCATTCT TGGAAAGTTG CCTGTTTCATT	2940
	TTTTAAGAAT GTCGCGTTAT CTGCGCCCAT TGATTGACAT ACTTCAATAC CGTAATAATA	3000
25	TTTATTACCT ATTTGATTAG CGGTATGCCA ACCTACTTGT GATTCATCTA AGGCTTGCCA	3060
	AACTGTGTTG CCTGATACGT AACTATGCGC AATGCCCGCT TCTAATCTTG ATAAAGGTGC	3120
	ATTTACTAAT CCGTTACGAT ATGCTTCAGC AGTCGCCCCT TTGCTCCCTG CGTCGTTGTG	3180
30	TATAACTATA CCTTTAGGGT TACTACCACG CTTAGGTAGG TCATAACCTT TAACCACATC	3240
	TTTGATGATT TTAAGTTCTA CTGCTTTAGG TTGTGGCTTA GCTGTTTCTT TTTTAGGTGC	3300
	TTGTGTAGGA GATTGAACTG ATCGTGGCGC TGTCTCACTT TTAAAAATTCG GACGGATAAA	3360
35	CCACATAGGG AAATCATAAG CATGTTGTCG TCTTGTAAC TTTTCCCAAC CCCAGCCGGG	3420
	TTGTTCGATT CCGTCAGTCC AGCCACCGCC TAGCCAATTC TGCTCATATA CAATGATGTA	3480
40	ATCTAAAGTT GCTTCAATTA CCCATGCAAC GTGACCATAT CCAGCACCGT AGTTGCTACC	3540
	GAATACCACC ATGTCGCCAG GTTGTGCTAA GAAGTCCGGT GTATTTTGGT ATACAGTAGC	3600
	TAATCCGTCG AAGTTGTTAG CGAACGGAAT ATCTTTTGCA CCTAAACCTT TTAGAAGTAA	3660
45	TCCAAACAAA ACTTTCCAAC CAGCATTGGC ATAATCAAAG CATTGAAATC CATACCATAA	3720
	GTCCACATTG AATTGTTTTT CCTCAGAAGT TTTCAACCAC TCTATAAACT CATTTTtagT	3780
	TAATTTTGCT TGCATTGTCG CCACCTCCAT GATGATACTC ATTCACATCA AAGCCAACAT	3840
50	CGTTAGAGGC GTCTGTGAAA GGTGTGATG TATCATATTC TTTTGGTGcT TTCGCGCTTA	3900
	ATTCCGGCGT TAAACTACTG TCTGTGATG ATTTCCACGT AACTTGTGTG TCTTCTTTTT	3960

55

EP 0 786 519 A2

	TTGGGTCAGT AATAACGCCA ATACCTGTAA GTAACGTGAG GATAGCGCCT ATAATTGCGC	4080
	TAGCTTGATT TAATTGAGTA GATAAATCTA ATCCGAATAA ATCCGTGACT TGCTTGATAA	4140
5	ATAGCAACAA TGCTCCAAC TAAACAGTTA GTACTGCTTT GTTTTTGAAT CTCAATTTCC	4200
	AGTTAATATC CATTGTGTTG CTCCTTTTAT CCAAAATAAA AAAACGACTA AAAATTAGTC	4260
	GTTTAAAATT ATTCAATGGT CAATGTCGGA GATCCTGAAT AAACATCACT TATAGTGACG	4320
10	TACAACATCC CTGAAGGATT ACTAAAGTTG ATATTTTTAC TTGCAACTCC GCTATTGACT	4380
	CCTGATATTC CTAAATCACT TGACCCTAAA TTAGTTTGCG AAATCCTCAT TATACCGCTA	4440
15	CGTACATTTT CTATTGTCAC CTGATAACTT TTATTGGGTT CAACTCCATT TATTGTCCAT	4500
	TTTGCTGTTG ATTCTTCTAT GCTATCCGGA TATTATTTT TAGGTAAGGG TTTTATTACA	4560
	AAAGATGAAG GCTTTTTCCA TACTTGATA TTTCCAGCAT ATACTTTTGT ATATTCTTCA	4620
20	CCTTCGTAAA TAAACTTCTT TACATTTTTA AAATTACCTT CCATAAAAAT CACCCTTTAA	4680
	TTAAATATAA CGTATTCGGG TCTTTTTGAT ATATATAGTT ATATTCATTT TCTGTTCCTG	4740
	TCCAAATTTT AACCGTCGGT TGAGATGCGC TTTTLAGTTG ATATAAATTA TCCGCTTGTT	4800
25	GTTTAGTAAA AGCTTGAGAT GACAAAACAT ACCGCTCGTC ATGATTATGA TTTTGTGGAG	4860
	CATATAAATC ATTTAGTGTT TGTTTGAATT CCTCAAAATC TTCTGTATTA ACTTTTGAGC	4920
	CAATCTGTTG CAATACACTT TCTGAAATAG AGTTGTTTTG TATTGCTTCT GCTAATTCTC	4980
30	TTAATGTGTT CATAGATTCA GCGCGCTAT CAACTAGTTC AGCAATTTT GTATCCGTAT	5040
	ACGTTTTAGA GTCGTTGAGA GTTGATCTT TGATTTTTTC AACTTCTTGC AATTTATTTT	5100
	CTAACCCTTC AACATTTGCG ATATTGATTT TGTCCAATAA CTCAGGTTCT GCTTTGATAT	5160
35	CTGTATCTTT ACCATCAATT TGCCACATTT TAGTGTCAGG ATTGATTGAT ACTACAGTAC	5220
	CGTTTTTACC GGGTGCGCCT TGTCTCCTT TTTTACCTGC TTCACCTTTT GCTCCAGGTT	5280
	GTCCCGGTTT ACCTTTATCA CCTTTCGCAC CTTTAAATCT ACTTTCATTC TTTTCGATGT	5340
40	AAGAAATGAC ATCTTTATCT ATTTTCTCTT TAAAGTCTT GCTCAATAAA TCTGTCGCGT	5400
	TATCTTTTAA AATTCTCGTA ATAGCATCAT CTACCAATTT AACATCGATT TCTTTTGCTA	5460
45	CAGCAGATTC AATACCACTA TCAACGATAT TGAAAGAAAA GTTTGCGACA TGTATTTTTT	5520
	CTTCTTCTTT CTCTAAAAAC AGCTTACAGC GAACATAACC AGCGTGTTTG ATAACCTTTT	5580
	TAGGTATCTT GTAGGTAAGG AAACCTTTTA CAACATCGTC GATAATAAGG GGCTCATTTT	5640
50	TGAATATAGA GCCATCTTCC ATAAACAAAT GTAATCTAGG TGTTAAGCCA TGTGCTTTTA	5700
	GATCGATACG ACCTTGTTTG TCATTGATAC CTATTCTTAT AGATGCTGTA TTTTCATCTT	5760

55

EP 0 786 519 A2

	CAACATCTTT TATTTTGTAC ATTTACACAC CTCTTTATTT ATATTATCC CTTGTGAAGT	5880
	AGATACCTTT TAAGCCGATT TGTTTATATA ACTTAGCGAT TGTACTTGCT TGATGTTGGC	5940
5	ACCACTCTAT AGCAGTAGCG TATTGGTGGG TAGCTGGATT CTTAGGATTC CATCTAATTC	6000
	GGTACAATGT GTTTTGACCT TTATTGATGT AATCCTTTCT TACGAAGCTA GCACCGCCCA	6060
	TGATTGCTTT TGCTGGAGAT GTCCAACTT TATTCCTTGC AAACGTCATT GCGTAGTTAG	6120
10	GATTGTTGTC GTAAGCGCCA ATGCCGAAGT AGTTGTATAC TCCATCTTTT CCGTTAGCGA	6180
	AGTACTTGT TCCATATCCA CTTTCTAAGA AAGCATGCGC GATTAAATAA ATTCATTAA	6240
	TGTTGTGCTT TTTACAAGCT TCTGCGAAGC CTTTACCTTG ATTATTCAAT GTTCCCTTAC	6300
15	CTTTAAGTAT CTTATTAAGT GCGCTAACTG AAACACCTTG ATACTGCGCT AAATTAAGCA	6360
	TTTGGTAGCA TTGTGTGTTA CTTTCCATA TACGCTTTAC ATTCAATGCT GAACTCGTTT	6420
20	GTGCTCGTGT AGCGTTAscc AACCCCAAGC ATTAGATTTT TTCGGGTAC CTCTTGCCAT	6480
	TTGTTTATCC AGTGCTTGTT TGAATGTATA AGGACTCGTT TCTGTTATGA TCTGCGGTTG	6540
	TTTAGATGCC GAACCATTGT TGGCTGTTGG TGACGAGTCT CTTACATTAG CTATATCAGC	6600
25	GTTTTTATTA TCTACCATAA CTTTATTCT AGATTTTGTT ACTGTTGGCT TAGTTATAGA	6660
	ATTTAATAAT TTTTCTCTGT TTTTAAATAT ATTAAGTAAT GCCTTTTCTA ATGCTTCGTA	6720
	TTTATCTTTA GGAGGAACAC CGTTGTCAAT CATATTCCAA TTAACATGTT CCAACATTGA	6780
30	ACGCCAAATG CTGTCGTCTA CTTTAAATT TTCAATACTT AGAGGTATCT CATATTTGGC	6840
	CATCATATCT ACAGCTACAA CCATTGCGTG AATCTCATTA AAAATAAATT CATTTTTACT	6900
	CGCACTATAA TCTTCACATA CGTCTATAAC TATATAATCA GGTTCATTAG GAACTTCAA	6960
35	TACAGCTCTT CTAGGTGCCC AAATATTATG TCTATCAACA TAAAAGTGGG GATATTCTAC	7020
	ATCCTGTTTG TATTTCTTCC TACTGTTATA TAACTTTCT ACCGAGCTCA TCGTTTGTGC	7080
40	GTTTCTAATC ATTATTCCTT TAGGTTTTTC GAGTCGTCGA TTACCTTCTA CTATAAAGTG	7140
	ATAAATATAT TCTGGATAAT TAACCTCTTG GCTAGAAATA GTGTACTTTA TAGTTGTTAC	7200
	ATCTTTCCAA ATTGGAACCT TTTTATTATT TTTTTCGTTA TCATCACTAT CATCTTCTGG	7260
45	TTTAGGTGCC GGTGTAGTTT TGTCTGGATG ATATGGTGGT CTAACAAAAT ATTTAACCCC	7320
	TCCACCTGGT CCATCATGAT AAGAGTGTTC AATTTTATAA GGTGGACTTC CTGTTGCGTT	7380
	ATTTGTATAC CAGTTTGTAT CTACGCCATA CCAATAGTCT TTTGTGCATG GTCCCACTAC	7440
50	AATGTTTACA TGTCCTGCCC AACCACCAGT CCAAACACCC CAGTCGCCTG GTTGTGGTAC	7500
	AAAATCTTTT GTATTTCTAA TTATCTTGAA ATCTCTACCT CTATAATTGG ATTTTTGAGC	7560

55

EP 0 786 519 A2

	TAAATCCCAG CATTGTGCTC CCATTCCAGA ACCAGGTACA TCAATAGCTA TTTTGTTTTT	7680
	AGCGATATAT AACGCCCATT CAACCACTTC ACTAGCTGTG GGCTTTCTAT TTTTCGGATT	7740
5	AGGTAATCCC ATGTATGCAC CTCATTTCAA TCAAAATAAA AAGCCAGTGC CGAAGCACTG	7800
	ACTCTTAACT GTTATTTACA TTTACCAAAC CAGAAGCACG CCCAGAAGCT ATATCCTAAA	7860
	ATCCCTTTAA GCATGGTAAT CACCTCCTTT AAATACCAAA AACAGTTCTT AGTAAAGCTA	7920
10	TGACAATCGT ACTGAAGATA GTCCCTATCA AACCTAGAAT CCACATTTTT ATGTCTCTAA	7980
	TATTCTTGGC ATTCTTTTCT TTATTCTTTT CATCTTCTAC CTTGTCGCGC TTTAATTCTT	8040
	CAAAATTTCT ATCTAATTG TCATAAATCT TTTCTTGC GC TCTAAGACTA TCTTCTATTC	8100
15	TGTCGAATTT TTCAAACATA GTCTTATCAT TTTCTTCTAA TCGCGTTAAA CGCCAATCTT	8160
	GTTCAATGTCG TTTGGTAAAT CCAAACATTA TGCCACCCAC TTTATTCAAA TTAAAAAGCC	8220
20	ACAAGCATTAA CACCTGTGAC TTTTCATCTT TTGTTTCTGG ATATTTTTCT CCAGTGATTA	8280
	AAGCGTATTC TTCTTTATCG ATTAAACCCT TGTCTACGTA CCACTTAATT TGCTCGTTTT	8340
	TATAGTAACC CCAAACATAA AAAGTTTAA TGTCTTTAAA AGTTGGATAA ATCATCTTCA	8400
25	TTATTTAAAC GTCCCCCTCA GTACTTGTTT TGTTAGTTTT CAGTTCAGTC AACTGTTGTG	8460
	TTAACATAGC GTTTTGTTGA GCTAATTCCA TTGTTAATAC GTTACTTGT GCCACCTGCA	8520
	TTTGCATACT CGCAACCATT CCGCGAAGTT CCTCATCACT TAAATCTGAC GCACTTTGTT	8580
30	GGTTTGATGC ATTCGGTACG TCTTCTTTTT CGAAATTGCT ATTGTATTTA ATTCGCCGT	8640
	TAGTGAAAAC AAACCTTCTA GGTTCGAACT CTCTTTTAAA TTTAATAGGC ACATTGTTAT	8700
	CATCTACATC TAAACTATTG CGTAAACCGC CAGTATTAAC GAATCCGATA ACTTCGTTTT	8760
35	TATCGTTTAC TGTGATTTTC ATTATTTCCA CCCCATAATT TTAGTTATAG TAACTTTGTT	8820
	GGCAJTCGCT CCAGAACCTG ATGTTTTACC TAAATCAAAG TACACATCGT TATCTATTCT	8880
	TAAAGTAGTG CTACTTGTTT TGGATAGTAA GCACTCATAA ATACCGCCAC CGTTGCCGTC	8940
40	TGAGTCAACT ACATTGCTT TACTCAATG AATCGCGTTA GGTAATGCGG TTAGTCCGAA	9000
	TCCCTCAATA ACGCCACCTG GATAAGTTCC ACTTACCAAC AAAATAGAAT AGTTTGTTGA	9060
45	CGGTTTCAGT AGATTGATTG TTGTACCTAC ACCATTTGCG CCACCGTCGA ACAATACCGT	9120
	TGATTTATGT TCATTAGGAA CTGTCCACTG TTGCTCAAGT CTGCCGTTG TGATTGATCG	9180
	TGTGTAAATC TTTTLAGAGT TATAAGGTGT GAAGTTAAAT AGCTTGTTG TATCATCTTT	9240
50	AACGAATACC GATAAATAAC CCTCATAACT TTCAACGCTA CCTGGTAAAT CCGGCACTCT	9300
	TGTTGCATAG TAATTACCAG CAGTTAAATA TCCCAAATCG CCTTGCGCAT TATTTAAGTT	9360

55

EP 0 786 519 A2

GAATTTATCA TCTACATACT GCTTAGCTTG ATTTAAAGCG TTGTTAGACG TTTCTTCAAC 9480
 AAATTGCTTA GTTAAGTTTC CATCATTTCTT TTTATAAAAC GGGTACCATG TGCCGTAGAT 9540
 5 TTTGTATTTT GTGTACTCAT CGTTTGAATC GTCTGGGTAC CATGTTGCAC GAGCAGTATT 9600
 ATTATCAACA ACATAAACAA CTAACACACC AGATTTGCTT GATGTATAAG TTGATTCATC 9660
 GAACGAAGAA CCGTCATCAA CACCATCTTG TCCAGGCTTC TCTAACGTGC CTATATCCGT 9720
 10 CTTTTCTGGC GCATCTGTTG CATTAGTAAT ATGAATAATC CTAGATGTGT TAACTGCGCT 9780
 TAAAACGCTA TCTATGGACT GCTCATACGA TTCAATTGCT TTACCGTAAT CATCTGTAAG 9840
 TTTAGACTTT TGCCAATTCC TTGTTGAATT ACCTTTAACA AGGTCAGCGC CATTGATTTG 9900
 15 TTGTTCAACT TCGTTAACAC GTTCAAAAAT CGCTTGCTCT TTTTCAACTA TTTTATCGAA 9960
 TTCAGCTGTA ACAGCTTGTTG TTGCACTAGT TTGCGTCGCA GTAATAGCTT GTATAGCTTC 10020
 GTTTTGCTTG ATTTTCGATT GTTGAATGCC TTTTGTCGCA CTATCATTCA CTTTGTCTAT 10080
 20 TAACGTTTGT GTATCAGCCA TATTTTGCTT TAATTGGTTA AAATCTTTAC CGACAGCTTC 10140
 GATAGTATCT TGAATAGATT TGATATAAAC AAGCTTTGTT ATACCATCAA ACCCACTAAC 10200
 25 TAAATCATTT TCAATATTGA AGCTAAATTG ACGTTCAACA ACAACATTAT TACTCCCCTT 10260
 TTGTGTAAAG AATGCCTGAG CATGCACCTT GCCTGAATGT TTTAAAAATT CATTCCGGTAT 10320
 CACATACTGC AAACGCCCAT TAATTGCGTC TACTATCGTT AATTCGTCTG AAATATAAGC 10380
 30 GCCTCTATCT ACGTTATAAT CATCGGTTTT TAAaACGATA GATGTTTTAA CATGTTTACA 10440
 ACTTATAGAT AAGGGTCTGT TATnCTTAGT 10470

(2) INFORMATION FOR SEQ ID NO: 21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 3647 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 21:

ATCAGATCTT GAGAATCGAG TTATTAAGTC TATCGAAGAC TTAATAAAA TCCAACCATT 60
 CATGCCTACA CAAGATTTTG ATTTTAAAAC TAAAGAAATT CAATCAAACA TTTCTGAAGA 120
 AAGATTTATC GAAATGATTC AGTATTTCAA AGAGAAAATA ACAGAAGGGG ATATGTTCCA 180
 50 AGTTGTGCCA TCAAGAATTT ACAAATATGC GcATCATGCT AGTCAGCATT TAAATCAACT 240
 TTCGTTTCAA CTGTATCAAA ATTTAAAACG ACAAACCCA AGTCCATATA TGTATTATCT 300

EP 0 786 519 A2

	TCAAATTGTA	ACAACTAATC	CTATTGCAGG	TACGATTCAA	CGTGGTGAGA	CGACACAAAT	420
	AGATAATGAG	AATATGAAAC	AACTACTTAA	TGATCCAAAA	GAATGCAGCG	AACATCGTAT	480
5	GCTAGTTGAT	TTAGGACGTA	ATGATATTCA	TAGAGTAAGT	AAAATCGGTA	CCTCAAAAAT	540
	TACTAAATTA	ATGGTTATTG	AAAAATATGA	ACATGTTATG	CATATCGTAA	GTGAAGTCAC	600
	AGGTAAAATA	AATCAAAATT	TATCGCCAAT	GACAGTTATT	GCGAATTTAT	TACCAACAGG	660
10	TACCGTTTCA	GGTGCACCAA	AATTACGTGC	AATTGAAAGA	ATATATGAAC	AATATCCACA	720
	TAAACGGGGC	GTTTATAGTG	GTGGTGTGG	ATACATAAAT	TGTAATCATA	ACTTAGATTT	780
15	TGCAITAGCA	ATTGGAACGA	TGATGATAGA	TGAGCAGTAT	ATCAACGTAG	AAGCTGGTTG	840
	TGGCGTTGTA	TATGATTCTA	TTCCTGAAAA	AGAACTGAAT	GAAACGAAAT	TGAAAGCTAA	900
	AAGCTTATTG	GAGGTGAGCC	CATGATCTTA	GTTGTAGATA	ATTATGATTC	CTTACATAT	960
20	AACCTAGTGG	ATATTGTTGC	TCAACATACT	GACGTCATTG	TTCAATACCC	TGATGATGAT	1020
	AATGTGCTGA	ATCAATCGGT	GGACGCTGTT	ATTATATCTC	CTGGTCCAGG	GCATCCATTA	1080
	GACGATCAAC	AGTTAATGAA	AATCATATCA	ACCTATCAAC	ACAAACCCAT	TTAGGTATT	1140
25	TGTTTAGGGG	CTCAGGCACT	GACTTGTTAC	TACGGTGGAG	AAGTCATTAA	AGGCGACAAG	1200
	GTTATGCACG	GCAAAGTTGA	TACACTAAAG	GTTATATCGC	ATCATCAACA	TCTGTTATAT	1260
	CAAGATATAC	CAGAACAGTT	TTCAATTATG	AGATATCATT	CATTAATAAG	TAACCCTGAC	1320
30	AATTTTCCAG	AAGAATTGAA	AATTACTGGA	CGTACCAAAG	ATTGTATACA	GTCATTCGAG	1380
	CATAAGAAAA	GACCGCATT	TGGTATTCAG	TACCATCCTG	AATCATTTGC	TACAGACTAT	1440
	GGTGTCAAAA	TAATTACAAA	TTTCATTAAT	CTAGTGAAGG	AAGGATGAAA	ACCATGACAT	1500
35	TACTAACAAG	AATAAAAACT	GAACTATAT	TACTTGAAAG	CGACATTAAA	GAGCTAATCG	1560
	ATATACTTAT	TTCTCCTAGT	ATTGGAAGT	ATATTAAATA	TGAATTACTT	AGTTCCTATT	1620
	CGGAGCGAGA	AATCCAACAA	CAAGAATTAA	CATATATTGT	ACGTAGCTTA	ATTAATACAA	1680
40	TGTATCCACA	TCAACCATGT	TATGAAGGGG	CTATGTGTGT	GTGCGGCACA	GGTGGTGACA	1740
	AGTCAAATAG	TTCAACATT	TCAACGACTG	TTGCTTTTGT	TGTAGCAAGT	GCTGGcGTAA	1800
45	AAGTTATAAA	ACATGGtAAT	AAAAGTATTA	CCTCaAATTC	aGGTAGTACG	GATTTGtTAA	1860
	ATCAAATGAA	CATACAAaCA	ACAACTGTTG	ATGATACACC	TAACCAATTA	AATGAnAAAG	1920
	ACCTTGTATT	CATTGGTGCA	aCTGAATCAT	ATCCAATCAT	GAAGTATATG	CAACCAGTTA	1980
50	GAAAAATGAT	TGGAAAGCCT	ACAATATTAA	ACCTTGTGGG	TCCATTAAAT	AATCCATATC	2040
	ACTTAACGTA	TCAAATGGTA	GGCGTCTTTG	ATCCTACAAA	GTAAAGTTA	GTTGCTAAAA	2100

55

	AAGCAACACT ATCTGGTGAT AATTTGATAT ATGAATTGAC TGAAGATGGA GAAATCAAAA	2220
	ATTACACATT AAATGCGACT GATTATGGTT TGAACATGC GCCGAATAGT GATTTTAAAG	2280
5	GCGGTTCAAC TGAAGAAAAT TTAGCAATCT CCCTTAATAT CTTGAATGGT AAAGATCAGT	2340
	CAAGTCGACG TGATGTTGTC TTAATAATG CCGGTTTAAAG CCTTTATGTT GCAGAGAAA	2400
	TGGATACCAT CGCAGAAGGC ATAGAACTTG CAACTACATT GATTGATAAT GGTGAAGCAT	2460
10	TGGAAAAATA CCATCAAATG AGAGGTGAAT AATATGACGA TTTTATCAGA AATTGTTAAA	2520
	TATAAACAGT CACTTTTACA AAATGGCTAT TATCAAGACA AACTTAATAC CTTGAAAAGT	2580
	GTGAAGATTC AGAATAAAAA ATCTTTTATA AACGCAATTG AGAAAGAACC AAAGCTAGCA	2640
15	ATTATTGCAG AAATTAAATC GAAGAGTCCT ACAGTTAATG ACTTACCTGA ACGAGATTTA	2700
	TCGCAACAAA TCTCAGATTA TGACCAATAT GGTGCAAATG CCGTGTCCAT TTTAACTGAT	2760
	GAAAAGTACT TTGGTGGTAG TTTTGAAAGA TTACAAGCAT TGACGACAAA AACACATTA	2820
20	CCCGTATTAT GCAAAGACTT TATTATAGAC CCGCTTCAA TTGATGTTGC TAAACAAGCT	2880
	GGTGCATCTA TGATTTTATT GATCGTTAAC ATCTTATCTG ATAAACAATT GAAAGATTTA	2940
	TATAACTACG CTATATCGCA AAATCTAGAA GTGTTAGTTG AAGTACATGA TCGCCATGAA	3000
25	TTAGAACGTG CCTATAAGGT TAATGCTAAA TTGATTGGTG TAAATAACAG GGACTTAAAA	3060
	CGATTTGTGA CAAATGTGGA ACATACAAAT ACTATTTTAG AAAATAAAAA AACAAATCAT	3120
30	TATTATATTT CTGAAAGTGG TATTCACGAT GCATCTGATG TAAGAAAAAT CTTGCATAGT	3180
	GGTATCGATG GCTTACTAAT AGGTGAGGCG CTTATGCGTT GTGACAATCT ATCTGAATTT	3240
	TTACCACAAC TGAAAATGCA AAAGGTGAAG TCATGATGAA ATTGAAATTT TGTGGCTTTA	3300
35	CATCAATAAA GGATGTTACA GCGGCCAGTC AATTACCTAT TGATGCGATA GGTTCATCC	3360
	ATTATGAAAA AAGTAAAAGG CATCAACAA TTACCCAAAT AAAAAAGTTA GCGTCTGCTG	3420
	TTCCAAATCA TATCGATAAA GTATGTGTCA TGGTAAATCC TGATTTAACA ACAATTGAAC	3480
40	ACGTATTAAG CAATACGTCA ATTAACACAA TACAGTTACA CgGCACAGAA TCTATTGATT	3540
	TTATACAGGA AATTAAAAAG AAATATTCAA GCATTAAAT CACTAAAGCT TTAGCTGCag	3600
45	ATGgAAAAcm TwATCCCAA caTtAAtnAA tnTTAgGGG TCCGTGG	3647

(2) INFORMATION FOR SEQ ID NO: 22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 5966 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

	CcAcCTTGAC CACCTTTACG TGGAATCTTT TcmCCTkGAG CAACaTCGaT AATaTATATT	60
5	GAAAgTCAAC AAGTTCTGGA CTAAATGTTG CTGCTAAGTT ATCGCCACCA GATTCTATGA	120
	AAATTAGTTC TATATCGTCA TGACGTTCTA ATAATTCGTC TATTGCTGCA AAGTTCATAG	180
	ATGCATCTTC ACGAATCGCA GTATGAGGAC ATCCACCAGT TTCAACACCA ATGATACGAC	240
10	TTTCAGGTAG AACTCCTGAA TTTACTAATA TCTTTTCGTC TTCTTTTGTA TATATATCAT	300
	TTGTAATAAC GCCGATACTC ATTTCTTTTG AAAGACGTTT TACAACTTTT TCAATTAATT	360
	GTGTTTTACC TGCACCTACA GGACCACCAA TACCAATTTT AATCGGATTT GCCACAATTA	420
15	TAACCTCCTA TGATATGAAA tTCTAACATT GaCGTTCTCA TGCGCCATTT GATTTAGTTC	480
	TAAACCAGGC GCTGTCATGC CAAAATCTGC TTCTTTTAAT TCGAAAATCT GCTTCTTGT	540
20	TCCTTCTATA TAAGGAATCA TGTGAGTAAC TATCTTTTGA CCAGCAGTTT GTCCAAGTGG	600
	AATAGCACGA ACAGCATTTT GAGTTAAACT TGAAACATTT TGATATAAAT AGTAATCAAT	660
	AATCGTTTCA ATATCTACAC CTAAATGATG GCCTAGCATA GTAAAACAAA TAGCTGGATT	720
25	ThACTTTGCT TTCTTATCTT GCATTTGTTG ATGATACCAA GCAATCCATG GGCTATtATA	780
	AAGTTCTAAA GCCAATTTAA CCATGCGAGT CCCCATTTGT KTTGCACCAA CACGTGTTTC	840
	TTTAGGTAAG TTTTGzACAr ACATCAGTTT ATCTATGTGT AATACTTTTT GTGTATCATC	900
30	ATTTTCCAAT GCATCATAAA CTaaACGCAT GGCTAAACCA TCAGAATAGG TAAGTTGCTC	960
	TTGTAAAAAC ATTTTTAACC AAGCAATAAA AGTATGATCG TCATGAATTA TATTTCGTTG	1020
35	AATATATGTT TCAAGACCAA ATGAATGACT GAAAGCACCT GTTGGAACT GTGAATCACA	1080
	GAACTGAAAT AATCTTAAGT GTGTATGATC AATCATGAGA ATGCCCTATA TGTCTGAAAG	1140
	CCTtATTAAC TTTACGGTCT TCTCGAACAT ATGGGATGCC TAAACTTTTT AATAAATCTT	1200
40	CAACTAAATA ATCATATTGT ACTAGCATTT CAGTCTCTGT AAATTGTGCT GGCAAATGAC	1260
	GATTTCTTAA TTGATGGGCT ATATCTCCCA TTTCTTGCAA TGTTCTTGGT TGAATCACTA	1320
	AAAGATCTTC TGAATTAACA TCCACAATAA TCATATTATG GTCATCTGCG TATAAAATAT	1380
45	CTCCATATTG TAAGTCAATA GGTtGTTTTA AACGAATGCC TATTTTCAGT CCATGGTCTG	1440
	TAACGACTCT TTGAATACGT TTAACAAGAT CTGAATTTTC AAGGTATACT TTTTCGACGT	1500
50	GCTTTTGTTT TTCTGAATTT GACAAATTGG CAATATTGCC TTGGATTTCT TCAACAATCA	1560
	TTCTATGTTT CTCCTAGAAT AAGAAGTATC TTTGAGTTAA TGGTAACTCA GTTGCTGCAT	1620
	TACTTGTAAT TTTTCTCCA TCTACATATA CTTCATATGT TTGTGGATCA ACGTCTAATT	1680
55		

EP 0 786 519 A2

	GACGCACCAT GCGTTTTAAA TTAAATGCAC GATTGATACC ATTTTCATAA GCAGTTTTAG	1800
	ACACGAATGT CATTGACGTA CTTGTAAGGT TTCCGCCGTA TTGACCATAAC ATTTTACGGT	1860
5	ACTTCATCGG TTCAGATGTA GGTATAGAAC CATTTCGATC GCCATTTACG GCAGAGTTAA	1920
	TTAATCCGCC CTTTACAAC TAAATCAGGT TAACCCCAA GAAAATTGGG TCCATAAGA	1980
10	CAATGTCAGC TAGTTTGCCC GGCTCGATAG ATCCTACATA TTCAGAAATA CCATGTGTAA	2040
	TTGCTGGGTT AATTGTATAT TTAGCGATAT AACGTTTGAT GCGATTATTA TCATTATGTT	2100
	CAAAATCACC ATCTAAAGGA CCACGTTGTT CTTTCATGCG ATGTGCTACT TGCCATGTTT	2160
15	GTGTAATTAC TTCACCTACA CGGCCCATG CTTGTGAATC GGAACATACT ATACTGAATA	2220
	CACCCATATC TTGCAGAACA TCTTCTGCTG CAATCGTTTC TTTACGAATA CGTGAATCTG	2280
	CGAATGCGAT ATCTTCAGGA ATAGCCGCAT TTAAATGGTG AGTAATCATT ACCATATCTA	2340
20	AATGTTTCATC TACAGTATTA TGTGTATAAG GCAAAGTTGG ATTTGTAGAT GAAGGTAAAA	2400
	TATTTGAAAA TGCAGCGGAT TTAATTAAAT CAGGCGCATG ACCGCCACCA GCACCTTCAG	2460
25	TATGGTACAT ATGAAGTACA CGGTCTTTAA CAGCAGCCAT TGTGTCTTCC ATAAATCCTG	2520
	CTTCATTTAA AGTATCTGCA TGTAATGCAA TTTGAACATC AAATTCATCA GCAACATCTA	2580
	ATGCATGACT CAAAGCAGAT GGTGTTGCAC CCCAGTCTTC ATGTACTTTT AATCCAATTG	2640
30	CTCCGGCATT GATTTGTTCA ATGAGTGCAG TTGGATTTGT TGCTTGTCTT TTACCTGTAA	2700
	AACCGACATT AATCGGTAAA CcTTCCGGCAG CTTCTAACAT TCTATGAATA TGCCATGGAC	2760
	CTGGAGTTAC AGTTGTTGCT TTAGAACCTT CTGAAGCACC AGTACCACCA CCAATATGAG	2820
35	TCGTAATACC ACTTTCTAAT GCGACCTCTG CTTGTTTCAGG ATTAATAAAA TGAACATGAG	2880
	TATCAATACC ACCAGCAGTG ACGATTTTAC CTTTCAGCGC AATGATATCT GTTGTGTAAC	2940
	CTATAATAAT GTCGACATTA TCCATTATAT CTGGGTTGCC GGCATTACCT ATGGCGAAAA	3000
40	TATAACCATT TTTAATGCCT ATATCAGCTT TAACCACTTT ATCGTAATCG ATAATAACGG	3060
	CATTAGAAAT GACAAGGTCT GCAACGTTCA CGTCATCAGC TGTTACACGA GGATTTTGCC	3120
45	CCATACCGTC TCTAATAGAT TTACCACCAC CAAAAGTAGC TTCTTCACCA TAAACCGCAT	3180
	AGTCTTTTTT TATTTGAGCA AATAGATTCG TATCACCTAA ACGAATGGAA TCTCCAACAG	3240
	TTGGACCGTA TAAGCTCGTA TATTGATTTT GCGTCATTTT AAAGCTCATG ATCTTTTTCC	3300
50	TCCTTTTTTA TTCACGTTTT CAGCACCGTT ATCTCCGAAT ACACCTGCAT ATTCATCATT	3360
	TTCATCAGTT GGGCGATAGA CACGTGACTC ATCGATAGGA CCATTGACCA TACCACGAAA	3420
55	ACCAAAAATT TTACGTTTGC CAGCATATTC AACTAATTGA ACTTCTTTTT TATCCCCAGG	3480

EP 0 786 519 A2

	TTCGAAATCT AATGCTGCAT TTGCTTCATA AAAATGAAAA TGTGAGCCCA CTTGAATTGG	3600
5	TCGATCTCCT GTATTTTCAA CTTGATAAC TGTTCAGGA TGATGGTTAT TAATTTCAAC	3660
	CTCTGTACTT TTTGTAATAA TTTCTCCTGG TATCATTTGA CTGCCTCCTT TAAACAATAG	3720
	GGTGATGTAC TGTGATTAAC TTAGTACCAT CGGGGAACGT AGCCTCGATT TCGATATCTG	3780
10	TAATCATGTG TTCGACACCA TCCATGACAT CTTCTTTGTT TAGAATTTGT CTACCATAAC	3840
	TCATTAACTC TGCAACGGTC TTACCATCGC GTGCACCTTC TAATAATTCA TCGCTGATTA	3900
	AAGCTAATGC CTCAGGATGA TTTAGTTTCA AACCACGTGC TTTACGACGA CGTGCAACTT	3960
15	CCGCCGCCAC TACAATCATT AATTTGTCTT GCTCTCGTTG TGTAAAATGC AAATTAAAC	4020
	CCCCAATTTT ATATTAGATA CaATTTACAA AATTTATATT AATCCTAATT GTTGTGATAA	4080
	ACAAGTAATA TACAAAGTTC AATGTGTAAT TAGAAAATTA TATTTTTAGC ATATCCGATA	4140
20	TTGAAGCAAA CAATCTAATC GAAAACAAAT AGTGGAATAT ATTTATGTAA AAACCAAAAT	4200
	AGTTTTTAAT ATAACTTTTC ATAGAATAGT AGTATATTAA TGAGTAATGA TTCAAAGGAA	4260
25	AGGTGAAAGA TTTGAAGATA ATAGATGTGC TTTTGAAAAA TATATCTCAG GTTGTGTTAA	4320
	TTAGTAATAA ATGGACAGGA TTATTTATCT TAATAGGATT ATTTGTAGCC GATTGGACAA	4380
	TTGGATTAGC GGCTATTGTA GGTAGCATCA TCGCCTATAC TTTGCGCGT TTTATAAATT	4440
30	ATAGTGAGGC AGAGATTAAT GATGGGTTAG CTGGATTTAA TCCAGTGCTA ACTGCCATTG	4500
	CGTTAACAAT CTTTTTAGAT AAGTCAGGAT TAGATATTGT TATAACAATG ATAGCAACTT	4560
	TATTAACGTT ACCAGTTGCT GCTGCAGTGA GAGAAGTTTT AAGACCATAT AAAGTTCCGA	4620
35	TGCTGACGAT GCCTTTTGTC ATTGTGACTT GGTTTACAAT TTTACTTTCA GGACAGGTTA	4680
	AATTTGTAGA TACATCGTTA AAGTTAATGC CTCAAAACAT TGAAACGGTT AATTTTAGCA	4740
	ACAATGATAG AATaCATTTC ATTCAGTCAT TATTTGAAGG ATTCAGTCAA GTATTTATCG	4800
40	AAGCGAGTGT AATTGGTGCC GTATGTATTT TAATCGGCAT ATTGATAGCA TCAAGAAAAG	4860
	CAACACTCTT AGCTGTTATA GCTAGTTTGT TAAGCTTTAT CATGTAGCT CTATTAGGTG	4920
45	GTAATTATGA TGATATTAAT CAGGGATTAT TCGGTTATAA CTTTGTATTA ATGGCAATCG	4980
	CACTAGGATA TACATTTAAA ACAGCGATTA ACCCTTATAT TTCGACTTTT TTAGGTGTGT	5040
	TATTAACAGT AGTGGTGCAA CTAGGTACAA CAACATTGCT TGAACCGTTT GGCTTACCTG	5100
50	CATTAACATT GCCATTTATT ATCGTGACAT GGATTTTATT ATTTGCTGGT ATTAAACATG	5160
	ACAAAGTAGA TGCTTGATAG TTAAATCAAA CCTAATATTG TTTGAATATC ACCTTAAACT	5220
55	ATACAGCGAA TTGTATAGTT TAAGGTGTAT TTTTATGGAT AAAATTAAGT GCATACTTAA	5280

GTGTAAACT AGGAATAAAT AATTTATATT GTGTGTTGTG TGGGGTGAAT AATATGAATG 5400
 ATATGGATAA TTCCTTTTAA ATAACAACGG AAATTCAAAG AAAATGGATT GAAAAATTCA 5460
 5 AAGTAATTAG AGATACATTT AAGGCTAAAG CTGAATATAA TGATCAACAT AGCCAATTTTC 5520
 CATATAAAAA TATTGAATGG TTAATTAAAG AAGGTTATGG AAAATTAACG TTACCAAAAG 5580
 CATATGGTGG TGAAGGTGCG ACCATAGAAG ACATGGTTAT TTTGCAATCA TTTTATAGGCG 5640
 10 AACTTGATGG TGCCACAGCA TTATCTATTG GTTGGCATGT GAGTGTCTGTA GGACAAATTT 5700
 ATGAACAGAA ATTATGGTCT CAAGATATGT TGGAGCAATT TGCTGTTGAA ATTAATAATG 5760
 GTGCATTAGT TAATAGAGCA GTTAGTGAAG CTGAAATGGG TAGTCCAACA AGAGGGGGAA 5820
 15 GACCAAGTAC ACATGCTGTT AAAGCTGATG ATGGGTATAT TTAAATGGT GTGAAGACAT 5880
 ATACATCAAT GAGTAAAGCA CTAACACATA TTATTGTTGC TGCTTATATA GAAGAATTAG 5940
 20 AAAGTGTGG TTTTTTCTTA GTAGAC 5966

(2) INFORMATION FOR SEQ ID NO: 23:

(i) SEQUENCE CHARACTERISTICS:

25 (A) LENGTH: 17310 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

30 CTGTGTCATC GCGAAATAGT TAGGGTCATT CATTAACTCT TTTGAACGTA TTTCATCAAA 60
 35 ATATAACAAT TTCATTAGTA AAGGGGACTT GTTCAAACCA GCTATAATAC AAAATAGACC 120
 TATAGTCACA CTGCTTATAA TATAAGAGGT AACGATCACT TTTTGTCTAT TACCTAACTT 180
 AAAGETGATC ATCCCTAAAT AGAAATAAAT GACTACAAAT GCATATTTAA CTGTAGATGC 240
 40 AAGAACTTCC TTAACCGTAA TAAATATCAA ATCATCAAAA AATaGCaAAC AArGCGTAAT 300
 AATCATACGA TATGTATACA AAATAATGAm AAAGTGTmAA AAATGATTTG CCTTTAATAA 360
 ATGGTTAGCG AAAACAGTA AATAAACTAA TATTAGTAAT GTGATAAAGT CAGCTATAGA 420
 45 AACATTCACA CCGGCAATAA CCGAAGATTG CTGAATAAAA ACCGCTAAAC CGATAAGTAA 480
 CAATGTTAGT AATTTACTAT TGTGTTGATT TTCCATTATA AACGTCTTCC ACTTCTTTAA 540
 50 TCATTTTCTC CTCAGTAAAA CATTCTAAAT AACGTTTCT AGATTGATTA CTCATTTTGA 600
 TGTAATCACT GTCTATTAAA TATTTTCCA GGACTTTAGC AATAGTTTCG GGTGGTTGT 660
 TCATCATACA TATACCATTA TCAGCTACTA ATTCTGAAAT ACCGCCAACA TGAAGGCTA 720

55

EP 0 786 519 A2

	TTATTAAAT AAACGTATCG TATTGTGATA ATAAATGACT CGCATTAAATG ACATTGCCCA	840
	AAAATGTGAC ATCATTCTCT AACCCAGCTT GTACAACTTG TTGCTGACAA TCATTTAATG	900
5	TAGGTCCATC GCCTATAAAT GTAAAATGCG CATGATTACT GTTATGTAAT TTCAATATCT	960
	CTATTGCCGC GATTAGATTT TGTGGCAATT TTGGATAAGC AAATCTTGCA ATCATAACAA	1020
10	ATTGATGCTT TGTCGGGGCA TTAATCTGTA AATCTTGTTT ATTAGGCAAC ATTCCAATA	1080
	CTTCGCCAAT ATTGTTATGT GATTGGCTTT TTAGCGTTTG CTTAACAGCG GGAACATCTG	1140
	CAATACCATT ATGTATTGTG GTTAATTTCA ATCGATTAAA TCGATATTTT AACGCTAACT	1200
15	GTTTATCGAA ATCTGAAACA CAAATAATGC TATCTGTAAT AAGTGACATT AATTTTTCGA	1260
	TAACTAAATA TAGAAATTTT TTAGCTGGTT TAACACCCTC TGTAAAAGCC CATCCATGTG	1320
	CAGTAAAAAC TATACGTGTG TCTTTCGATT TCGAAATGAa CTtCGCAATT CGTCCGACCG	1380
20	TtCCAGCTTT GGAAGAATGT AAATGGATAA CATCAGGTTT AATTTTCGAG AATAACTGTG	1440
	CTAACACTTT GACAGCTAAA ATATCTTGTT TAAAGTCAAT TGGACCTACT AAATGTTTGA	1500
25	TAATAATTAC ATTAACTCTT GCATCTAGTT GTTCAATCAT TGGTCCATGA TTGCCTACAA	1560
	TGACATAAAC ATCATTGTGT ACGCAAAAAT GGTGGCGAG TTGAATGAGA TGTGTTTGTG	1620
	CACCACCATT GTCTGCTTTA GTAATACAAT ATATAATTTT CAACTGTTAC AAACCCCTTT	1680
30	AATGCTATAC TTTCAATTTT TTAACATGGC TATCTCATCA GATGAATAGT ATTTATAGCC	1740
	ATGCAATCA ATGATGGCAC ATATTTCTTA ATGCCATTG ATACTGTCTC AAGGGATTCC	1800
	TCGTTATACT GTAACAATTG GTCACAATCT TTAAAATATA ACTTTTATTT GAACTTATTA	1860
35	AGTAAATTAA GACTACCTTG AGCCTTCCCC TGTAATAACA ACCATCAATG TTCTAATTGA	1920
	TATATATAGT TCCATCATTA AACTACCTTT ATGTATATAT TTCATGTCAT ATTTTCAGTTT	1980
	TTGTTGCGGT GTTAAGTCAT ATCCACCTTG AATTTGCGCA AGTCCTGTTA ACCCTGGTGT	2040
40	AACAAGACAT CTTTGCTCGA AACCTATCAC TTCTGAACTA AATAATTCTA CAAATTCCGG	2100
	ACGTTCCGGG CGTGGTCCAA TAAACTCAT TTCCCCTTTA ACAACATTAA TTAGTTGTGG	2160
45	TAATTCATCA ATGCGTGTTT TACGAATAAA CTTCCCGACA TTTGTTATAC GATCATCATC	2220
	TTTATCAGCC CATTGCGCAC CGTTTTTCTC TCGGTTTTTG CACATCGAAC GTAATTTGTA	2280
	TATTTTAATT AATTTACCCA TCTTCCCAAC TCTAACCTGA CTATAAATAG GGTTTCCTGG	2340
50	CGAATCTATG ACGATAGCAA TGGCGAATAT AACCATAATC GGTAAGTTA AAAATAATAA	2400
	AACAATGCTT AAAATTAAGT CAATCGCACG TTTAATTGGG TAATAGCTTT TTCTCACTTC	2460
55	TTCTAGTTTG TCTAATTTTC TTTGATAGGC ATAACCCTTA TTATTATGGA CAGCTTCAAT	2520

	AATTAAAGTA ATCCTTTTAA CCTGTTTCTA CTGTATATTT AGGAACAAAT CCTAATGCCT	2640
	TTAAGTTAGA AATATCTGCA TAAGAATGCT TAATATCTCC TTTTCGTGCT TCTTTAAATT	2700
5	CATGCTCGAC TGATTTTCCA TATAATTCAC CAATAATACG ATAAACCTCT AATAAATTAG	2760
	TAAAAGTGCC TGTACCAATG TTATAACCGT GTCCAATTGC ATCTTTGTGT TCCATAATTA	2820
10	AGCGTACAGA TTGAACAACA TCATATACAT ATACAAAATC TCTAGTTTGC AGTCCGTCAC	2880
	CAAAAAATGT AAATGGCTTG TTATGCTCAA ATGAATCGAA CATCTTTGAA ATCACACCTG	2940
	AATATTGTGA CTTAGGATCC TGTCTTGGCC CAAATACATT AAAAAATTTA ACAACCGCTG	3000
15	TTGGTATGTT ATATAACGAA CAATAATTTA ATGTCGTCCG TTCGCCGTAA TATTTATCTA	3060
	TTGCATATGG TGATAATGGT AAGATTAATG ATTGATCACT TTTAGGCAAA TCAGGAAGAT	3120
	CACCATAAAC AGCTGCTGAC GAAGCAAAGA TAAAACGTTT TATATGATTA TTATATTTTT	3180
20	TAATGATTTT TAACAATCTT AATGTTGCTA CGACGTTTAT TTCTTGAGAT AAGATAGGTT	3240
	TCTCAACCGA CTCAGCAACA CTAACCTAATG CTGCTAAATG AATAACATAA TCAAATTGAT	3300
25	ATGTCTTCAT GATTTGTTCA ACTGCATCAT ATTCACGAAT ATCTAATTCA AACACATGAT	3360
	CGTCAGCCAA ACTTTTAATA TTTTCTCGTT TACCTGTTCT ATAGTTATCT AGAACATAAA	3420
	CATCATAATC TTGTTGTAAA TCATCTACTA AATGCGACCC AATAAAACCA GCCCCACCAG	3480
30	TTATCAAAAC TCTTTCCAAA TCTTCCACCT CATTTATACA TTAAAAATAT ATCATAAAAA	3540
	CATAAAGTAT TGTAAGCTTT TTATCGATAT TTTTATTTA TAAAAATAAA ATGAGATAAC	3600
	TTTGTGAATT TTTATTGAGA TAAATTAGAT AGTGGTGTTT TTGTGATGTT TTATAATATC	3660
35	TTGGGTGTGT TAATACTAAT AATGCTTTCA ACTGATGCAT TAGACTGTGA CATCATAACT	3720
	CACTTAAGAA CTTGCTTAT TAATTTTCTA CCAATACACT CCCTTCTAAG TGCACTAAAA	3780
	AATCCTTACT GCTAAGTGAT TAACTTAAC AATAAGGATT TATTTATCAT TAGTGGATGA	3840
40	TTATTAACGG AATCTCATAC CACCATCTAC AATAATTGTT TGTCCAGTAA TGTAATCAGA	3900
	GTCTTTACCA GCTAAGAAGC TCACTACATT TGAAACATCT TCTGGTTGAG AAACCTCTGCC	3960
45	CAAAGCAATC TGACTTGTA AATTGTTCCCA ACCCATGCT TCAGGTTTAC CTGCTTCTTC	4020
	GGCTGTTGCC ACTGCGATAC TTTCCATCAT TGGTGTGTTGA ACGATACCAG GTGCGAATGC	4080
	ATTCACAGTA ATACCTTCAG ACGCTAAATC TTGTGCGGCT ACTTGTGTTA AACCTCGCAC	4140
50	TGCGAATTTT GTACTGCAAT ATAAAGACAA GCCTGGGTTA CCCTCAACGC CTGCTTGAGA	4200
	TGTTGCATG ATAATTTTAC CGCCATGATT GAATTTTTTA AATTGTTCAT GTGCGGCTTG	4260
55	AATACCCCAT AGCACACCTG CAACGTTTAC GCCATATACT GTTTTAACT GTTCTTCAGT	4320

EP 0 786 519 A2

GCCAAATTGC GCGGCAGTTT GTCTTactGC GTTAAATACA TCATCACGGT TTGATACATC 4440
 TGCTTTGATA GCAATAGCTT TTGTACCATC ACTTGATAAT TTAAGTGCAG CTGCTTTTGC 4500
 5 CCCTTCTTCA TTGAAATCAA CAACTGCTAC TTTGAAACCA TCTTCCACTA AACGTTCTGC 4560
 AATTTTAAAA CCAATCCCTT GTGcTCCGCC AGTTACTAAT GCTACTTTGT TGTtTGTCAT 4620
 AAAGATCACT CCTCAAATTT CTTTCCTTTA ATTACATTTT ACTCCTCTTC ATTTGAATAG 4680
 10 TACAACAAAG GTAGCTCCAT TTAACAAAAT ATTcAGATAT TTAAGGTATA GTTAAACGCA 4740
 CTACCATTAG TGATTGGCAA TGCGTTTAAa TGTCGTTTTA AAAGTTCTTA TGTtGAATAT 4800
 15 TATTTTTTTT AGTCTCTCGA TTAGTTTGTC ATCAATCTTT TTTcGAGACA TGgTCTTTTG 4860
 ATTCAATAGG CGGTTCCGTG TTATCACTGA CAACTTTAGT TGTAGCTTCA TCTTTATGTA 4920
 TTTCTTCGTT AAATCCTTCA AGGTTTTTAG TCGTGGGATT TTTAACCTCA GGATGTTCCA 4980
 20 TCATGTCTTG ACTATCAAGT TCCTTTTTAC ACGTGTCTTT ATGTGATGCT TGATTGCGT 5040
 TCCCTTTACT TTTTGAATA GTGGTAGTAT CTGCTGCAGC TACTAATTTT TTTCTACCTA 5100
 AAATAGATAT GGCTGAAACA AACCAGAGTA TTGCAGATAC AAAGTTGCAT AATACTAAAG 5160
 25 CGATAATAGC CAATACAATT AATATGACAC CTTTTGAAAT CCTTCTTTA AATAAGTCAG 5220
 ATGCCAATAC GATGACAGGT ACGATTGAAA GTATAATTAC AAATATAGAA ATTATTGCCG 5280
 ATATAACTAT TGTTACTATT AAATAATCAG CTCTGCTACC TGATAATAAA TAGAAAAGGC 5340
 30 CGAAAATTAG TCCATAGCAA ATTACAAACC CACATAAAGT TATAGCCATG AGTACTATAT 5400
 AAGCTATTTG AAAATATAAA CCTATCTTTA TGAATGATTT TTCTACATTT TTTCCATGT 5460
 35 CTATTCCTCA TTTATTTAAa ATTTATACTT TACCTTAAAT ATTCTCTTTA TTCTTTAGTG 5520
 ATTTTATCTT TAGATTCAAA TTGATTCTCT GTACTTTCAA TATCAACTTT TTCATTTTCG 5580
 TCTGTCGATT CATCTTTTGA GTATTTATTc CAAATCAGCA AAATACCACC AATCAGCCAT 5640
 40 AAAATTGACG AAAGGAAATT ATATAAACAC AGTGCAATAA TAGCATAAAC AATAAAAAGT 5700
 GCACCTCCGA TTACAGAGTA ACTTTCCATA TAAATCGCAG TAAAGATGGT TGGTAAAACA 5760
 GTGAAAAGAG CCAATATTAA TCCTAATAAA AAAATTGTTT CGTAATCAGA TCCTCCAGCA 5820
 45 ATATTAATAG ATATCATCCT AACAAAAACG AACTAAAAT ATATTTGAGC TACGATGCCT 5880
 ATCCAAATTG CTATTTTTTC TATAATTGAG CTCATACTCA TTCCCCATTT ATTTAAAATT 5940
 50 TATACTTTAC CTTAATATAC CTTATTTTAT TTAATTTTTA TATGCAAAAT ACAAAAATGG 6000
 AGAACTTCAA TATTTATAAA ATATCAAAAG TTCTCCACAC TATATTGTTT TATTATATTT 6060
 TCGCTATCAA TACGCTAAAT CATCATATTT CCCTCAACAT CACAGTAAAA CTATTGCTCC 6120

55

EP 0 786 519 A2

	TTCCAATTGC GCAGTTGTTC AACATCATCA TCTTGTITAA GTAATGCCAG TGGTACTTGA	6240
	AGATTAAAGAC ATCGTCCTGA AATATTAAAG CGTGTACACAC CTGCTGGCAC AGTTTCCCCCT	6300
5	TTATGAACAA CCGCTTCAAT TTCCTTATAA CTCAATGGCT GATACTTCAT GAGTACATCT	6360
	TGTTGAGAAA GACAAGGATA TGTACCTTGT GCAATTCTCT CTACAGAACA ACAACCACTA	6420
10	TAACTTGCGA CAACCTTTTC CCATACTTGA AAATGTGCTT CGCCTAAATC TTTTGTATAC	6480
	AAATATTGTT CTGTATCACC ATGACACATT GTAATAAATG GCGCTTCTTG TCTTGTCTCA	6540
	GTAGTCCATG GCAAGCGATG TTCTTGTGTG AACGTTTCCC ACCACACACC AAATGGAAC	6600
15	TTATGTTGCC ATGTACTAAT TGAATATTGT GTTTCATGGA TTTCTTGCAC TGGAACTTTC	6660
	TTACATCCTA ACGCTTTCAA ACTTGTATAC CGATGCACAC CATCTATAAC CATATATCTA	6720
	CCATGTTGCA TCGCTGTCAC TAAAATAGGA TGACGTATAA AATCATCTGC TTCAATACTA	6780
20	CTTTTCGTTT TTTCCAATCT TAAAGGTTTG AATGTTTCGT GAAGATCAAT CTTATCTACT	6840
	GGTACCAATT TTAAATGTTT ATGAATATGA TTCAATAGTT ATTCATCCTC CTTTGTTTGT	6900
	GTTAAATAAA TAAATTCAGG ATGTGGATGG CTTAAGAAAT CGTGATGTGA AATAGACCAT	6960
25	CCGTATGCAC CTGCATATTT GAAAACAATA ACGTCGCCTG TACTGATTGC GTCTATCTGT	7020
	ACTTCTCTAG CAAAGACATC TTTCGGTGTA CATAATTGAC CGACTAACGT TGTGTCCTGT	7080
30	CTCGAAATTG AAACCTTTTC AAATGAATAT GGATTGTCCT TATAGCGATA AATGTCAAAA	7140
	GGATGGTTAT GTTGCCAAGA TACCGGCAGT CTAAATTGTT GCGTACCTCC TCTTAATATG	7200
	GCATACCAAG CACCATGTAC TTTCTTAATG TCTAGCACTT CTGTCACATA GTAACCAATA	7260
35	TGTGCCACAA TAAAGCGCCC ACATTCAAAG TTCAATGTCA CATCTCCAT TTCTTGCTCA	7320
	ACGATAAGTG TTTTAAAACG TTCTACAAAA TTATCCCATT CAAATTGGTT AGTTAAATCT	7380
	GCATAGTTAA CGCCTATGCC ACCACCAAGA TTGATATGTT TGAGTGGAAT TCGATGTTTT	7440
40	TCAGACCATG CCTTTGCTTT TTTAAAATAA AGTTTCACTA CATCGACATG TAAATTCGAG	7500
	TCTAAATTGT TAGAAATAGA ATGAAAATGA AATCCATCTA GATGAATCTT TGGCATTGCG	7560
	AGCGCAGcTT CAATGACATC ATCAACTTCG TCTTCAGAAA TACCAAATTG TGTGGGGCGT	7620
45	CCTGCCATAT GCAACGTTGC ATTGGGAAAT GGTCTGCTA AATTAACACG CAATAAAATG	7680
	TGTTGTGTCT TATCTTCATC TTCTAAGATG GCATTTAGCC GTTGTAATTC ATGCATACTT	7740
50	TCAACATGAA TACGCTGAAC ACCTTCACTT ACTGCATATC TTAGTTCCTC GTCTGTCTTA	7800
	CCAGGGCCAC CAAAAATAAT ATGATTTGCT GGTTTAAAAG CAAGACCTTT TGCTATTTCA	7860
55	CCTTGAGATG CAACTTCGAA TCCTTCAACA TACTGACTAA TTGTATCTAG GATTTTTCGT	7920

EP 0 786 519 A2

TGTGCAAAT GATGTTCCAG TCCGACTAAA TCATAGATAT AATGACAAAC TGGATGAGAT 8040
 TGTGCTTTTA ATTGTTCAAT AACAGGTTGA ACTATACGCA TTAGCCTTCA TCCCCTTTCT 8100
 5 GTTTAGACGT CGCTAGAGAT GCACTTAAAT GCGATATAT TTTCCGCGA TCATCACCTA 8160
 AAATAAATGT TTGTACACCT TGTGCCTGCC ATTTTGCAAT ATCTTCATCT TCACGTGGTA 8220
 10 ATGCACAAAA ATGTTTACCA TGTGCATTCA CAACTTCAAA AATATGTTGA ACATGTGATG 8280
 TTACTTGATC ATCACGCGTT TGCCATGGTA TGCCAAGTGA CTGCGATAAA TCTGCGGCAC 8340
 CTTCGACTAT CATGTCTAAA CCTTCGACTT GTGCTATATC GTCAATGGCC ATAACCCCTT 8400
 15 CAACATCTTC TATCATGGCA ATCACCATAA TATGCTCATT AGCCATCTCC ATTGCATCAA 8460
 GTAATGGTGT ACGTCCAAAT CTTGCCATGC GACCACCATT CAAACTTCTT AATCCTTGCG 8520
 GGTAATAACG ACTTAATTTT ACAATATGCT CAACTGTCTC ACGATCTTTA ACGTGTGGCA 8580
 20 CAATAATACC TCTCGCACCC ATATCCAACA CTTTAATGAT ATCTCTATCT ATCACTGCAG 8640
 TGACACGTAC AATTGGTATA ATATGCGCTG CTTGAGCTGC ACGAATTAAA TCGGCTAGTG 8700
 TCTCATCATT AATCGCCACG TGTTCTGTAT CAATCACAAC AAAGTCATAC CCGCTTGCTG 8760
 25 CGATAACCTC GATCATCAAT GGGTCCGGTA TAGAATTAAA AATGCCATAA ACTGAATCAC 8820
 CATTGTTTTAA TCTATGTTTC AGAGATAGTT GTTGCATCAT TGATACCTCC TACACCTAAT 8880
 30 GGATTTGTAA CATGATGAAT TCTTAACTCG GAGTCACTTA ATAATCGACG TGTCGTTAAC 8940
 TTTTCAACTT GAATCGTAGG TTCAAACAAA TCGAAATGTT GATAGTTATT CAACTCTGGA 9000
 AATGCTTCTT GATACGCCTC GATGATGCCT TTAACCCATT GCCATTGCAG CTCCTCATCG 9060
 35 ATACCATATT GCTTTTCAAT AAATAAGATG ATTTGCGCGA TATTAATAAA GAAAAATGCA 9120
 TCATGTAAAA AGTCGCGTAC TAAACGTTCC TCATCTGTTT CAATAAATGA ATTACTATTC 9180
 ACTTFTTTAT GTGCTTCTGG CATTGGCTTT AATGTCAGGT GTGAAGCAGC TTCACTTAAA 9240
 40 TGctCACGCT TAAAACGAAC ACCATCATGG AAATCTTTTA AGGCAATACG TGTAGGCCAA 9300
 CCATTTTCAT GAATGAGCAT CATATTTTGT GCATGCGATT CAAAGGCAAT ACCGTGATAA 9360
 TAAAGCATAT GAATCATTGG ACGAATCGCT ACAGCTAAAA ATTGCTTTGT CCAAGCTTCA 9420
 45 GAACCATATT GTTTAATCCA ATTTTCAATG AATGGTACAC CATCCTTATC ACTTGATAA 9480
 AGTGCAATTA ATGGTATCGC ATCCTCTTCA TCGATTAAAC TATGATATAT ATTTTCACGC 9540
 50 CATATAACAC CTAACGCACC ATAACTTGA GTTTGTTTAT AAGGCGAAAG TTGTGTATTT 9600
 AAATAAGACT GTCCTAAGAC TTCCCTAGA AAAACTGTCT TTAATTCATC TTTTAAATAC 9660
 ATATCTTGTT GCTGTATCTG CTTTAACCAA TCCGTAATTT GCGCTGCATT TTCAATTGTA 9720

55

EP 0 786 519 A2

	TATTTTGTGCG TGTCTATTGG CGACATCGTA CGAATCGATT GTTGAGGGTG ATATAGCTCA	9840
	TCACTTTCCC CTAACCATAG TACTGTGCCA TTAAGCCTTT CTTCAGCCAA ATCAACTTGG	9900
5	ATGACATGTT CAAACTGCCA TGGGTGTACA GGTATCATCT CAACATCATT TACATGTTTG	9960
	CCAGATGCTT CAATTTGCTG TACAAAATGT TCATAAGTCT TATCGCCAAC TTGTTGACGT	10020
	AACATTTTCGT TAACTACAAC ATTTCTTGAT ACCGTCGTTT CTACTTTATC TTTGTCGATA	10080
10	GCTAACCACT GCAGTTTAAC GTTTGGTACA AAATCAGGAC CAAATTTCAA ATTATCACTC	10140
	AACGTAAATC CTAAACGTGA TTTGTAACTT GGATGATACT GATGCCCTTC CATCGCATAA	10200
15	AATTCATAGT CGTTAAATGT CTCAGGTGTT GCTGGTGGGT TTGATTCTCG ATACTGCATA	10260
	CTTTGCGTAT CTTTAAATTC TGTCTGTAAT AACTCGACAA TAAATGTTC TAGCTTTTCA	10320
	TCATTTTTAG GAAATGTAAA TACAACCTCT CTCAATAATT GTGTATAGTC TGTGTTGTA	10380
20	TCTGCCTCAT CTCCTACGAC ACGCTCAATT GGTGATGTGA TACGTATACG ATCAAAGCTA	10440
	TGTGTCTTTT CAGCAGTAAA ACGATACTCT GAATCATGTC CTTCTATTGT AAAATGACCG	10500
	ACACCGTCTT GATATGACGC TTTATACACA ACAATATTCT CATAAATAAG TGATGATACC	10560
25	AGTTGGTGCA TCACTCTAGT CTTTACACGA TTAAGAATTG TTTGATTAC AATACGATAC	10620
	CTCCTTGTTA TGACAAATTG GATTTGGTAT ATGTGTATAA ATAGGGTTTG CACCACAATC	10680
	ATTCAATTTA CTCATCAAAT TCGCTTTAGC CGCAATGGTC GGCCTTTGAT ATAAATCTTC	10740
30	TACACAGTCA ACAATACTG CGTTATTGCG GTATTCTTTT TTCCAAGTCA TAAGACGATG	10800
	CGCTACAAGT TGCCATAACA CAACTTCATT TCTAGTCGCT TTACCAATAG TTGATACTAA	10860
35	ATGTCCTAAG TGATTTACTA CAACGTAATA TTTAAGACGA TGCCATGCTT CATCATGTGC	10920
	ATATACAACA GGGCTTGATG CTGCCACAAC ATTTGGCACA AGCTGTTTTT CAGTAGCAAT	10980
	CGTTCTAGAT AGACAAATGC CTTCAAGATC TCTGACAAAG CATACGTCGG GTATGCCATC	11040
40	TTTTAATTCA ATTAATGTAT TTTGTACATG TGCTTCTAGA CTAATGCCTG TGTACTAAA	11100
	CAGCTTTAAT ATCGGCAATA ATGTACGATT CAAATAACAT TCAAGCCATG CTTCTGGTGC	11160
	TAAACCACTT TGCTCAATCA CTTGTGATAA CTTAGACATC GGTGAATCAG GCATCGTTTC	11220
45	AAATAATGAC GCCAATACAT GAATATCTTT ATCAGCATGG TAATTCGGTA TCCCTTCACG	11280
	AACAATCATG GCACTATTTG TTAATAAATC CATTCAGGT TCAACTGTTT GCCCTAATGG	11340
50	ATTCGGTAAC AATGCACGAT ATCCTTCTTC AAACATCAAT TTAATAATGGG GTGTTTCAAC	11400
	CTCATCTTTG ACTGATGCGA TAACTTGCGC GGCATCAATT GTCCGTTCOA TCTGTTCAAG	11460
	GTCATTCGTA CGTATAAAAT TAGTGATTTT AACGTGTATC GGTAATTTTA AATAAATGTT	11520

55

	GCCAAGGTCT TTTATTAAAC CTTGTTCACT ATATTGCATA TACTGTGGAT GCTGTCGCAA	11640
	CACATTGATT TGATAAGGAT GTGTTGGTAA TAAATAAAAA TCTTTGGGTA TCTCTGATAT	11700
5	ATCTATGTCT GCTAATTGAT ACAACACTTT CTCAACCTGA TCTTCTTTAC CTTCTACATA	11760
	GCGCGTGAGC AGAACATCTT GATGCACAGC TAAATAATGC AATTGGAATG ATGTATGACA	11820
10	TTCGGGTGCA TATTTCTCTA AATCTGCTTC TGAAAACCCA CTTGCACTCT TAGGAGTCGG	11880
	ATGAAATGGA TGACCTAAGT ATAAAGATTG TTCTGAAACG ATATAACGAT CCTCTACGTA	11940
	GTCTATTGTG TTACTTTGCA AATAACGTGC CGTGCGATGA ATGCTATTAT CGATGTCAGA	12000
15	CATAATTTGC GCCATATGTT GTTGCACTGC CGTTTGATTA TCTGCACTTT GAGCCATATG	12060
	TTGCAAAATA CGCGCAATTG CTTCTTTATA AGTTGTTATT TTTTACTTT TTCCATCGAT	12120
	AAGCCATACC TCTGGATGAT ACATATGATG CCCCATCGCA GACCAATAGC GAAATTCACC	12180
20	CGTTAAAGTT TCGAGCTCTG ATAATTGTAT AGACCATTGA TGATTTTGAG GTGGTACTTG	12240
	ATATAAATTT TCTTCTCTAA AATATTCATT TAAATGCGT TCGATAGCCG CATACGCTGC	12300
	ATGTTGTATT AATTCTTTAT TTTGCACTTT TTTGTTTCAA CTCCATAAT TTCATTAATG	12360
25	TGTGATCGTT GATTTGATTA GTGATGGTTG AACAAATTAA AAATAAACTA CTTACTGCAA	12420
	ATACTACGCC CATAACGATA AACGTAGTAG CTGGTGTAGT ATAAGTTGTA ATGGCAGCGC	12480
30	CACTaAGACT GCCAATAATT TGACCAACAA CTAACATACT GTTCGTCGTT CCAACAAATG	12540
	TGCCTTTAAG TTGTTGATGA CACGCATTCA CGACAACAAA CATGACACTT TGAATCAATG	12600
	CACTATATGT TAATCCTTGA AGTATTCTTG CAGCCATTAA AAAGTCTATA TTCGTCGCTA	12660
35	AACCTTGCGAG TATCGCACTA CAACCACATG CAATCGTGGC AAATATATAT ACTGATTTAA	12720
	CATATGATTT ATCATTAAAG CGTCCCCATA AAGGCGCGCT TAATATCGAA GCCGTCCAAA	12780
	ATGCGGACTG TAAAAATCCA ATCACACTAC GGTCATCTAT CGCTGTATGA TTCACTGATG	12840
40	AAGCAAGTGG TGATAATGCA GTTAGCATGC CATACATAGC AAAGTTTGCT AAAACGCCAA	12900
	CGATAATAAA TCGACATGTT TGTGTGTGTC ATAATAGACA TTGAAATGAA CGGCGAATAC	12960
45	CTTTATTAAT ATTTGGTGTT TGTGATTTTG GCATATGTGT CGTTTCAATC AATTTTAATG	13020
	CACCGAAAAT ACAGACAATA AAAGTAATAA CGGCAATACT CATCAGTAAC GCACTAAAAC	13080
	CTAATATCGA AGCTGTAACA CCGCCAATTA ATGGCCCCAC AAGAGACCCT GCGCTGACTG	13140
50	AACTTTGCAG TCTTCCTAAT ACCTTTCCAC GATCTTCAGC TGGCGCCTCT GCACTCGCAA	13200
	ACGCACTTGA TGCATCAACA ACACCACCAA ATAGTCCCTG CAATAACCTC ACAAGTACAA	13260
55	ACTGTAATGG TGTCGTACAC AATGCCATTA AAAATAAGCA TACCGCCAAA CCAAGTAACG	13320

	ctATCATCGT CGTTACAGCT GGAGCAGCAA TCGCTATACC ACTCCACAAC TGTATTTCTA	13440
5	CGACTGATAG ATTTTGTAGT GATGCCATAT AAATTGGCAA TAATGGCACA AGTACTGTCA	13500
	GTCCAGCAAT CGCTATAAAC TGA CTGAGCC ATAAATGCG AAAGTTACTG CGCCATATAG	13560
	ACTGATTAAT CATATGTCAC CATTGGATTT GGTACGGTAG TTAAACCTGA AGGCATACTA	13620
10	CCTCCACCAC TATCACGTTG ATATAGCAAT GGTAAATAAAA TTTGTTTGAA TGGCCACGTC	13680
	TGTTTATCAA ATAAATGTG TCTGACAGCT AGCTGATCAG TTGTAACCCA GGAAATAGTT	13740
	GCCACTTCAT TTTTAAAAAT TTGTTTAAAC AACGACATAA GTTCATGCTC ACTTACACCA	13800
15	AATAAATCTT GAATTGCATC AATAATGGCA TATAGATTTA CCGATACAGC TAATGTTTGA	13860
	AAATAAGCAA AGAATGTTTC CAAATCCTCA TTAATTAGCG TATTAGGTGT ATCTTCTCTG	13920
	ACGACATACT TCGGCAATGA AAGCTGATGT GCTGTTAGCC ATGGTTTATA AATTCTGACA	13980
20	GTATCATGAT CACGTAACAC GCATTTTGT ACACGTCCAT CTTCAAATGA CAACAATATA	14040
	TTTTGACCAT GCAACTCTGG TAATGCGCCG TATTGCATAA ATGATAGTGT TACCTTTAAA	14100
25	AAGACTTGCG CGATATCTTC AAATAACGTC ATGACATCAT TTTTAGAAAT ATTATCTTTT	14160
	CCACAAATCA TTTGATATAA AGTGCGATCA TTTGCCGCGA GTGCTGCCAT TGACACTAGC	14220
	TGTTGCGTAT CATTTTGGC TAGCACTTCG GGATACTTTC TTAGCTGAAC AGTTAGATGA	14280
30	CCTAATTGAT CTTTGAAAAT ATCATTATCT TGACCCATAT ATGACCACCA AGCTGTTTCA	14340
	TCACAAACCA TGACATACTT AGCTAGTGCT TCATCTTTTT CTATAAGCTG ACGTAATAAT	14400
	TGTTCTGCTT GTTCTCCGTT TTTTCATGTAA CGCGTAGGCG TTAGCCTTAA TGCGCCTAAT	14460
35	GACTGCATTG CAAATGGTAC TTTGACATGG TTATACGGTG CGCCAATATC AATTAATGAA	14520
	CGCATACTTG AAGACGACAG ATAATCTCCA AATTTTAAACG GTAATAGTAC AACCAACTTT	14580
	TCACTAATCT CTTTCGCAAA GACGTTCCGGC AGAATATGCT GATATTGCCA AGGATGTACC	14640
40	GGAAATAGTA CATAGTCATC TATTGATAAC CCTTGATCAT TTAACATGTC TGTCGCTTGT	14700
	TCTTTTATAG GTACTGTCAA ATTTTCTAAT TCATCGATAT TTGCAGTATC GCCATGAATC	14760
45	ATATGTGTCT TTTTAACTGC TGCAACCATT AAAGGAAATG ATTGATTTAA TTCAGCTTGA	14820
	TACACTTGAT AATCCGCTTC TCTTAATCCT CTTTTTCTT TAGCTAATGG ATGAAATGGA	14880
	CGATCTTTTA AACTTGCAAA CTGCTCTGAC ATCACAAGG GATGTGACGC TAAATCTAAT	14940
50	TCTGATAATT GTTTAGCAAG CTGTGTGGCA GCAGTAGTCA GTCCTTCTTC AACGCGAGCC	15000
	ACTTCCCATT CATGACTTAG ATCACAATTC ATATTAGCAA TTGTTTGCCA AAATTCAGCT	15060
55	GCCGTTAAAG GTTGCTTAGA CACCTTCCC TCTATCGTAA TTGGTTGTGA ACTTTCGTAA	15120

EP 0 786 519 A2

TATATCAAAA GCGTTTGTC GTTTCTTTA GTAATCTCAC TATTCGATAC AATTCGGCT 15240
 ATATCTTCAA ATAATAATGC ATCAACTAAA TCTCTTAATA TTATCGCTTG TGCTGTATTG 15300
 5 ACTGCTGTAT GATTCTGCAA TGTTCAGACA CCTCGCATT TTAATATAGG TTCAATGTTG 15360
 TCCCAATATT TTGTGTTGT GCCTGTTGAT AAATAAAATA AGCACTTGAA ATATCTTCGA 15420
 10 TAGCCATACC CATCGGATTA AGTAATATGA TCTCATCATC GTCTTCACGT CCTGGTATGT 15480
 CACCTGTCAC AAGTTGTCTT AGTTCAGCAT GAAGAGCTTC TTGCTGAAT TTACCTTCTA 15540
 ACACCAATTG GTTAATAGTT TTCTTTTCTC GATTACATTG TGACCAGTCA TCTACTACGA 15600
 15 CTTTGTGAGC TTAAATAAAG ACTTCTTTAT GCACATCCAT GATAGAAATG TTGCTAATAA 15660
 ATGCACCCTT TTGTAACCAA TCATATTCAA TGTATGGTTG ATCCGTTACG GTACATGTAA 15720
 TGACTACTTC ACCATTTGAT ACTGCTTCTT TAGCATTTTC TGTCGCAATA AAATTAATTT 15780
 20 CCGGACGCTG TTGTTGCCAT CTATCAACAA AGCGTGCACA TGCTTCAGAG AATTGATCGT 15840
 AAACAAACAC GCGTTCAATA TGATCGAATT GCTCTAACAT ACTTTGTAAT TGCTTGTCTC 15900
 CGATTAGCCC GCATCCAATG ATTGTTAAGT CTTTAAATCC TTTTGTAGCC AAATGCTTTG 15960
 25 CTGCAATCAC TGAAACTGCT GCAGTACGCA TACTACTAAT TAAACTTGCT TCCATAACTG 16020
 CAATTGGATA ATTCGTTTCT GGATCATTCA AAATAATGAC GCCACTTGCA CGCTCCATAT 16080
 30 TACGTTTCGA TGGATTGTCG TGCTTACTAC CTATCCACTT AATACCTGAA ATTGCGTGT 16140
 CACCACCGAT ATGACTTGGC ATTGCAATAA TTCGATCTGC GATGTGTCCA TTTTCAGGAT 16200
 CCTGTCTTAA ATACGGCTTA AGCGGTTGTA CAAATCATT GTGCGCATGG GCTGTTAATG 16260
 35 CTTCTGTAA TGCGTCCACA TAAACTTGTT AATGATTACC TCCCGCTTGT TCAATATCTG 16320
 ATCTATTTAA ATACAACATC TCTCTATCa TTCTGaTTTA ACTCCTTGTC TTGATTTTAT 16380
 TTTTCTAAC CATGTATCTG AATAAACTAA ATCTAAGTAA CGATCGCCTC GATCTGGTAA 16440
 40 AATCGTGACA ATTGTTGCAC CTTCTTCAAT TGACGTTATC AACTGCTCAA TCGCTGCAAT 16500
 AATCGAACCT GTTGAAcCTC CGGCAAATAT GCCTTCATAA TCAATCAGTT TTCGACAGCC 16560
 45 CAAAGCAGAT TGATAATCAT CTACATGGAT CACTTGATTA ATTTCTGATC TATTCAATAT 16620
 TTCGGGTACA CGACTAGCAC CGATACCAGG TAATTCTCTA TTAATAGGTT TGTCACCAAA 16680
 AATGACTGAC CCTTTCGCAT CAACAGCAAC AATTTGTGCG TTTGGATGCA CTTCTTTTAT 16740
 50 TTTTCTACTC ATACCATAA TGCTACCTGT CGTGCTGACT GGCGCGACAA AATAATCTAT 16800
 AGGTTGCTTA ATTGTTTCAA CAATCTCTGT GCCTGCACCA TGATAATGGG ATTGCCAATT 16860
 TAACTCATT GCATATTGAT TAATCCAATA TGCATCGTCA ATAGTGGCTA ACAGTTCTTG 16920
 55

TACATTGGCA CCATAACTTT TAATAATTTT CAAATTTGTT GGTGATATTT TAGGATCAAC 17040
 AACACACGTG AGTTTTAATC CCTTGATTTT AGCTATCATT GCCAACGCAA TGCCTAAATT 17100
 5 ACCAGAAGTA CTTTCAATTA AATGTGTATT CTCAGTGATT AAACCATGTT TAATACCATG 17160
 TTCAATGATG TACTTGGCAG GTCGATCTTT CATGCTGCCT CCAGGATTCA TATACTCTAA 17220
 10 CTTTGCAAAC ACTTCATGTT TCGGAAATAG TTGATGAAGT TGAACCATAG GTGTTTGCCC 17280
 TACAGAATCT AACAATGAAT CGTGCACATG 17310

(2) INFORMATION FOR SEQ ID NO: 24:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 5423 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

ATACTAGTAA GCGCATCGGT TATTGACATC GAATTCAACT TTAACAGTTT TCATGTTCGG 60
 25 TGATGTTTCA ATAGAATGTG TGTGTTGTAC TTGCGCATTT ATATTTCCAC CTAAATTACT 120
 TAAGTTTCCT GTAATACTAG AAATGTCAGG TCGGTTTAAT GTAGGTTGAA ATGCATCAAC 180
 30 TACTTTATCT GCAACATTAG AACATTACG GATAACTTTA CTTGAATGAT TATCTATAACC 240
 TTTAACGAAA CCTAACATTG AATACATACC AACATCCATG AATTCACGTG AAGGTGAGTG 300
 AATACCTAGC GCTCTTTTGG CTGCATTTAA AGCACCTTTT GCTACACTAG CTGCTTTTTTC 360
 35 AGCTAAGTCT CTAGCCATAT TACCAATACC TCTCATCAA CCACGGATCA TATCAGCACC 420
 TGCTGATACA AAGTCATCCA CAAAGCTTTT AACTTTATTT ACTGCATTTG TCATACCTTG 480
 ACTAACTTTG TTTACAACAT TAACGAATCC TTGAACAACT CTATTAACAA TGTTAATTAG 540
 40 CGTACTTGTT ATAGTAGATA CCCATnGCAT ACCTTTTAGTG ACmATGAAGT TCCAAGCTTG 600
 AGACATTTTG TCTGATATAG TTGAAACAAC TTGTGTGAAT ATGCTTACAA CTTTATTCCA 660
 AATTGTCGTT AATATACCAG ATAAGAACT CCAAATCGTA TTCCATATAT TAGAAATAAA 720
 45 ACTCCATGCC GCTTGTAACG CAGTAGATAT AGCTGTAGTG ATAGCGTTCC AAACCTTAGT 780
 TGCCACAGTA ACTATAGTGT TCCACAACGT TTGTAAGAAC GTCCAAATAG CGTTCCAAAT 840
 50 TGTTATTGCG ATAGTCATAA TTGTGGTAAA CACTGTAGTT ATTACAGTGA CTAACAAATT 900
 CCAAATCGTA GTAGCGATTG TAATTATCGT ATTCCAGATT GTACTTAAGA ACGTCCAAAT 960
 AGCTGTCCAT ATCGTCATAA CTATTGTCAT TATCGTCGTG AAAACAGTTG TAATGATTGT 1020

EP 0 786 519 A2

	ATAAGCGACT ATTTGATTCC AAACAATCAT TATAAAATTG TAAACATTCTG ATACTGCTGT	1140
	AGTGATAGCT GTTAAATAG CATTCCATAC AACCAGGCT ACAGCTTTTA ATACATTCCA	1200
5	AACATTAACC ATAAACGTTT TTATCGCATT CCAAGCATT ATAATAAAGT TTCTGAATCC	1260
	TTCATTTTTA TTCCACAATA AAACGAATAT AGCTATTAAT GCAGCAATTA CACCAATTAC	1320
10	TATTGTTATT GGACCGCCTA AAATACCAA CACAGTTACT AGTCCTGTGA TAGCATTCT	1380
	AATTAATCCA ATCTTACCGA ATAACAATTG GAATATAACT GATATAATTT TTAATGGTCC	1440
	TTTTAATAAC ATGAACGCAC CTTTTAAAT TGTTAATCCC GCTCTTAATA AACCAGACTT	1500
15	ACTTACTAAT GCAATGTTTC TACCTATTAA TCCGCCACCC ATAAAGTTAG ATACAGCAAG	1560
	AATAATCGGT ATTAAAAATC TAAATGCACC AACTAAAGTT ATAATGACAC CAACTAATTG	1620
	TGCTGTAGCT GGATGCGCCT CAAACAAGTT AGCTATCCAA CCAGTTATTG CAACTGCAAC	1680
20	GCGTAATACT GCACTAGCTA TAGGAGCCAT TGCTGTTGCG AATGCAATTA ATCCTCTTGC	1740
	GATGTTTCCA ATCAATTGCA TTATTAGTGG TCCATTGTGT TGTATATAAC TGACAAAGTC	1800
25	TTTAAACCCT TGAGATTGTC CTACTTGTTT AGACCATTCC CTAAACTTAG CTGTCAATTG	1860
	TTCAAGAGAT TGGAATATGC CAGTTGATGA TCCGCTGAAT GCATTCATCA AATTGTTAAT	1920
	TCCAACGAAA ACATTTTTGA AAATATTACC AATGATAGGT AAGTTTGTGT TTGTGTATTC	1980
30	AATAAACGA GTTATCGAAT TTTCTCCAGC TGCACTATTA GCCCAGTTAG AGAAAGATTG	2040
	ACCTAATCTA TCCAACCAAT CAGCCGACCA TTGAAACAGT GGTGCTAATT GCGTGAATAC	2100
	ATTGACTAAT CCGTCACCAA AACCACCTGC AGCACTTAAT AGCTTGTTAA ATACCGAAAC	2160
35	ACCCGTTGTA TTCATCATAT TAAAGAATCT TGAAGCTACA CTGCTATTTT CAGCCCATT	2220
	AAGCACGCTT TGAGACGCTT CTTCATTCC TCTTGAAATA CCACTAAAAA ACGGTTGTAA	2280
40	GCTCTGCATT GCAGTTTTAA CAGTATTTAA ACCATTGCA AGAGTTGTGA AGATAGCGGA	2340
	TTGATTTTGC TTTATAATAT CAGTCCATGC TGACTTTACG CCATCTAACG CTTTTTTGTA	2400
	TTCGTTTGTT GCTGAGCTAG CTTGTAAAGT GCCATCATTAGCATCTTTA TAGCGCTGAT	2460
45	AGCCATTGCG CCAAACGCTA CAAATCCTGC TCCCGCTATT GCTACGGCAC CACCTAAAGC	2520
	AAGTACACCA CCAGTTAACA CTTTGATAGC GTTTAATAGC GCAAATACTA CAGGTACTAC	2580
	GCTCGCTATT ACAGGTATTA AGATACTAAA AGATGATGTA AGTAATCCAC CAACCATATT	2640
50	AGAACCTACA GTACCGAACA CACGGAACAT ATTAGCTAAA TTCCCCATCT GTCTTTGAAA	2700
	ATTGTCATTI GCTTTTATTA TGTAGGCATA AGCTTTCTTT AAACCATTAG TATCGACATC	2760
55	TACCTTTGTT GTTTTTTGT TCGGCAATGC GTCTAATGAT TTTTAAACG CATAAATAGT	2820

EP 0 786 519 A2

	AAGTTCTTCT	TTAGTACGTT	TGATTTTAGA	GTTAGCAACA	CCATTGTCCA	CGTCTATAAT	2940
	AGCTTTGGCT	TTAGACCTAT	TTAATGCTTC	GAGACTAGCT	TTAGATACTT	TTAACACTCG	3000
5	ATTGAATTTA	CTGTTATCTG	CATTGACGTC	AATATTGACA	CGTTTCTTTT	CTAATTCTGA	3060
	TAATTTAGCT	TCTGTTTCAG	CGATATCTTT	AATCAACTTT	TGTTTTTGCA	ACTTAACTTC	3120
	TGGTGIAACT	TCTTTAGAGT	TTAGTTTGTC	TAGTTCAAAA	TTCGATTCTA	GTACCTTTTG	3180
10	TTGTAAATCT	TGTATACTAG	CATCTAATTT	AGCTTTTACA	TTTTTGTTAC	TAAAGGCATC	3240
	TAAAGACTTT	TTAGCAACTT	TGATAGTTTT	TTGTAAATTT	TTATCGTTAG	CGTTTAATTC	3300
15	AACATCTTTA	GTTTGATCTG	CTACTCGTTT	AAATCTTTGC	ACAGACTTAA	CCGCACATC	3360
	AATTTGCCTT	TTGAATTTGG	CTACACTAGC	TTCAATAGTC	GCTTTAATTT	TATATTCCGT	3420
	CACATTAACA	CCTCTCTTTC	TATTGCTTAT	TAAATTCTGC	TATAACTTTA	AAGAATTCAT	3480
20	TATTTTGTGG	TTCGTATTCA	TCACGTTCCG	TACTAAATCT	TATATCTTTA	CCTTCGTTAA	3540
	GCCGTTGGAT	ATTTTCTTCA	TAAGGCAATA	CGTCGTTTGC	ATTGTTAAAA	ACATATTCCT	3600
	CTTTAGGTTT	ATTTTCTGTC	CCAACATTTT	TAGTAGCTGC	AGCATCACGA	ATAGCAAACG	3660
25	CAAGTTTGTA	ACGTTCGAAT	TCTTGGGTTA	GCATTTCATA	CTCTTTCGCA	TACATTGAT	3720
	AGTTATATTC	TGTTAATGTC	ATTTGCTCAA	TAACGTTCAA	ATCTGTAATA	CCAAGTGTG	3780
	ACATACAAGT	TATAACGATT	CTGTCGTAAG	TTATTAGGCT	TCCGCTGGTT	TTTCTTCCGT	3840
30	TTCCACTACT	TCGACTAGGT	TTCGGGTCAT	AGGTCGCTTT	CCCAACTCCG	TTAAAATATC	3900
	CGAACCGAAT	TCTTCTAGTC	CGATATTTTC	TGCGATTTC	TCTAATGCTT	CATCAATGTT	3960
35	ATTAATAGTA	ATTGCTTGTT	TTTTTAAGTG	AGATGTAGCT	GCGATTAAAA	CTTCGCCAAT	4020
	CACAACCGGA	TTTCCACTTT	CTAACCTAC	AGGCAACATT	GATACACCTT	GACCGATAGA	4080
	AGCTTGGTTCA	ACTTTTAAAC	CTAATCGGTT	ATCGATTCTT	CTTAAAAATT	TAAAACCAAA	4140
40	ACTTAATTCT	AATGACTTTC	CGTTAATTTT	TACATTCATA	ACTTAAAATC	TCCATTCATA	4200
	ATTAATTTAA	ACAAAATAAA	marGCTTAAC	CCCCTATTTT	TATACCTCTC	TTGGTGCAAC	4260
	CGGTGGTGAA	TCTACTTTAG	GTTGTGGAAT	TGCTGTTAAA	TCTTCGCCAG	TTAATGCATC	4320
45	TGCTTTTGTA	GTGTCGTGGA	ATCTGTATcC	AGTCGCCTTA	AGTTTCTTTG	TTACAGCCTC	4380
	AGGTAGTGTT	GCAAATCCAC	GTTGGAAACG	ACCATTCACT	CCATATTCAT	ATTCATATTC	4440
50	ATCAATACCG	TTAGCTTCTG	CTTTTAATTC	AAATTTATTG	TGGAAACCTT	GGAAATATTT	4500
	CGCTTTAAAT	TTAGCGGAAT	CCCCATTTTT	GCCTGGTATT	CTACTTTCAA	CTTCCCAAGC	4560
	TTCATACAAT	ACGCGATCTA	CAACTGCATC	TTCAATTTCA	TCTGCAAAAT	CGTCACCATA	4620

55

	GTCCATTGTA TCCTCTGTAT CTGTATCAGC TTCATGTGAT AAGCCGTATT CAGTTAAAAA	4740
	AAGCATTTTA GTAGCATCTA CTTTTTCGCC AGCTTTTCTA AATAAAATAA TACGATCATT	4800
5	ACTATTTTTC ATATTTGCCA TTCAATATTC CTCCGTTTTT TAAAATGTTT TGTAAGATAT	4860
	CGTTACTGAT GTGTGTAGCA ATTCTTGATT GGTAGTATCA TCAACTAACT GTGTGATGTT	4920
10	AGTATCTTCT TCTTCAAAGT CATAATCGTT TGTTTTAACG CTAGGTGTTA AATCATCAAT	4980
	ACATCTTTTA ACAAGTCCGT CATGATGTCC TAAATCATCG CTTACACTCC AAATATCAAT	5040
	AACTAAATTC GTATCGCCAG AATAACTATC AAACGTGTAC TTACTTCTAT TTGACTCCGG	5100
15	CATTTTTTATT ACAAAAAAAG GATACGGAAT CTCTTGTTGC ATCTCTTTAC GAGAAATAAC	5160
	AGGGAATCCA TATCCTTGTA GCGTTTCATA CGCTTTATTA TAAAGTTGTA AGTTCGGTGT	5220
	CATGCTTTTA TCTCCTATTC AAACAACGCT TTCAATTCTT CTACAGTTGA TTCCTAATC	5280
20	ACTTCGTATA CCGGCCACAT AAAAGGTTCA GCCTCCATGT ATCGAGTACC AAATTCTAAG	5340
	AAACCACTAT AAGCTGCGTG CGATGTGATA GTGTATTGCA AATCGCCAGT TTTTTTATAT	5400
25	CTGATATTGC GTGATAAATT ACC	5423

(2) INFORMATION FOR SEQ ID NO: 25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6251 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:

	AAACGCAGAT GTTCAATTAG AACCAGTCTA TCGTATTAAAG GAAGGTATTA AACAAAAGCA	60
	AATACGAGAC CAAATTAGAC AAGCGTTAAA TGATGTGACA ATTCATGAAT GGTTAACTGA	120
40	TGAACTAAGA GAAAAATATA AATTAGAGAC CTTGGACTTT ACTTTGAACA CATTACATCA	180
	TCCTAAAAGT AAAGAGGATT TATTACGTGC TCGTAGAACC TATGCATTTA CTGAACTGTT	240
45	TTTATTGCGA TTACGTATGC AATGGCTAAA TAGATTAGAA AAGTCATCTG ACGAAGCAAT	300
	TGAAATTGAT TATGACATAG ACCAAGTTAA ATCATTATTT GATCGTTTAC CTTTGAAC	360
	AACTGAAGCA CAGAAATCCA GTGTTAATGA AATTTTLAGA GATTTAAAAG CACCAATACG	420
50	TATGCATCGA TTACTTCAAG GTGATGTAGG TTCAGGAAAA ACAGTAGTTG CTGCAATTTG	480
	TATGTATGCG TTAAAACTG CTGGTTATCA ATCAGCATTG ATGGTACCAA CTGAAATTTT	540
55	AGCAGAGCAA CATGCTGAAA GTTTAATGGC TTTATTTGGA GATTCTATGA ACGTTGCATT	600

	TACGATTGAT TGTTTAATTG GAACCCATGC TTTGATTCAA GATGATGTGA TTTTCCATAA	720
	TGTTGGTTTA GTAATTACAG ATGAACAACA TCGATTTGGT GTGAATCAAC GCCAGCTTTT	780
5	AAGAGAAAAA GGTGCAATGA CGAATGTGTT ATTTATGACA GCAACGCCGA TACCAAGAAC	840
	ACTAGCAATA TCAGTTTTTG GTGAGATGGA TGTGTCTTCA ATTAAACAAT TACCAAAGG	900
10	TCGTAAACCT ATCATTACTA CTTGGGCAAA GCATGAGCAA TACGATAAAG TTTTGATGCA	960
	AATGACCTCA GAGTTGAAAA AAGGTCGTCA AGCATATGTC ATTTGCCCCG TAATAGAAAG	1020
	TTCTGAGCAT CTCGAAGATG TTCAAATGT TGTGCGATTG TACGAGTCTT TACAACAGTA	1080
15	TTATGGTGT TCCCGTGTAG GGTTATTGCA TGGTAAGTTA TCTGCCGATG AAAAAGATGA	1140
	GGTCATGCAA AAGTTTAGTA ATCATGAGAT AAATGTTTGA GTTTCTACTA CTGTTGTTGA	1200
	AGTAGGTGTT AATGTACCGA ATGCAACTTT TATGATGATT TATGATGCCG ATCGCTTTGG	1260
20	ATTATCAACT TTACATCAGT TACGCGGTGCG TGTAGGTAGA AGTGACCAGC AAAGTTACTG	1320
	TGTTTTAATT GCATCCCCTA AAACAGAAAC AGGAATTGAA AGAATGACAA TTATGACACA	1380
25	AACAACGGAT GGATTTGAAT TGAGTGAACG AGACTTAGAA ATGCGTGGTC CTGGAGATTT	1440
	CTTTGGTGT AAACAAAGTG GaTTGCCAGA TTTCTTAGTT GCCAATTTAG TTGAAGATTA	1500
	TCGTATGTTA GAAGTTGCTC GTGATGAAGC AGCTGAACTT ATTCAATCTG GCGTATTCTT	1560
30	TGAAAATACG TATCAACATT TACGTCATTT TGTTGAAGAA AATTTATTAC ATCGTAGTTT	1620
	TGACTAATTG CCATGCTGAT TTGTCAATTT GAGTGCACa CTTGTTAAT TGAGTGATAT	1680
	GACACTTGAA CTATTTAAAT GTAAAGTGGT ATTTTAACAA TTTATAAATT TTCGACTAAA	1740
35	TAATAGCTAA ATATTACAGT TATTTGTGTA GTCGGTTAAA TAGAAAGTGT TATGATATGT	1800
	GAGGAATGTT TAAGACTAGG TACTAAAAA TGAGGGGTGA GACGTTGAAA CTAAAGAAAG	1860
	ATAAACGTAG AGAAGCAATC AGACAACAAA TTGATAGCAA TCCCTTCATC ACAGACCATG	1920
40	AACTAAGCGA CTTATTTCAA GTGAGTATAC AAACAATTCG TTtAGaTCGC ACTTATTTAA	1980
	ACATACCAGA ATTAAGGAAG CGTATTAAAT TAGTTGCTGA AAAGAATTAT GACCAAATAA	2040
45	GTTCTATTGA AGAACAAGAA TTTATTGGTG ATTTGATTCA AGTCAATCCa AATGTTAAAG	2100
	CGCAATCAAT TTTAGATATT ACATCGGATT CTGTTTTTCA TAAACTGGA ATTGCGCGTG	2160
	GTCATGTGCT GTTTGCTCAG GCAAATTCGT TATGTGTTGC GCTAATTAAG CAACCAACAG	2220
50	TTTTAACTCA TGAGAGTAGC ATTCAATTTA TTGAAAAAGT AAAATTAAAT GATACGGTAA	2280
	GAGCAGAAGC ACGAGTTGTA AATCAAACGT CAAACATTA TTACGTCGAA GTAAAGTCAT	2340
55	ATGTTAAACA TACATTAGTT TTCAAAGGAA ATTTTAAAT GTTTTATGAT AAGCGAGGAT	2400

	TTAGAAGCCG TACAAAAGGC TGTGAAGAC TTAAAGATC TAGAAATTAT ACTTTTCGGT	2520
	GACGAAAAAA AGTATAATCT GAACCATGAA CGAATCGAAT TTAGACATTG TTCTGAAAAG	2580
5	ATTGAAATGG AAGATGAGCC TGTTAGAGCG ATTAACGTA AAAAAGATAG CTCAATGGTA	2640
	AAAATGGCTG AAGCTGTGAA ATCTGGTGAA GCAGATGGAT GTGTGTCAGC AGGTAATACT	2700
10	GGTGCTTTAA TGTGAGCTGG TTTATTCATT GTTGACGTA TTAAAGGTGT AGCTAGACCG	2760
	GCTTTAGTAG TAACATTGCC AACGATTGAT GGAAGAGGTT TTGTCTTTTT AGACGTTGGT	2820
	GCAAATGCTG ATGCTAAACC TGAACACTTA TTACAGTATG CGCAACTAGG GGATATTTAT	2880
15	GCTCAAAAAA TTAGAGGTAT TGATAATCCG AAAATCTCAT TATTAAATAT AGGAACCGAG	2940
	CCAGCTAAAG GTAATAGTTT AACGAAAAAA TCATATGAGT TATTAAATCA TGATCATTCA	3000
	TTGAATTTTG TTGGGAATAT TGAAGCGAAG ACATTAATGG ATGGCGATAC AGATGTTGTA	3060
20	GTTACCGATG GCTATACTGG GAACATGGTC CTTAAAAATT TAGAAGGTAC TGCAAAATCA	3120
	ATCGGTAAAA TGTTAAAAGA TACGATTATG AGTAGTACTA AAAATAAATT AGCAGGTGCA	3180
25	ATATTGAAGA AAGATTTAGC TGAATTCGCT AAAAAGATGG ATTACTCAGA ATACGGTGGT	3240
	TCCGTATTAT TAGGATTGGA AGGTACTGTA GTTAAAGCAC ACGGTAGTTC AAATGCTAAA	3300
	GCTTTTTATT CTGCAATTAG ACAAGCGAAA ATCGCAGGAG AACAAAATAT TGTACAAACA	3360
30	ATGAAAGAGA CTGTAGGTGA AtCAAATGaG TaAAACAGCA ATTATTTTTC CGGGACAAGG	3420
	TGCCCCAAAA GTTGGTATGG CGCAAGATTT GTTTAACAAC AATGATCAAG CAACTGAAAT	3480
	TTTAACTTCA GCAGCGAACA CATTAGACTT TGATATTTTA GAGACAATGT TTACTGATGA	3540
35	AGAAGGTAAA TTGGGTGAAA CTGAAAACAC ACAACCAGCT TtATTGaCGC aTAGTTCGGC	3600
	ATTATTAGCA GCGCTAAAAA ATTTGAATCC TGATTTTACT ATGGGGCATA GTTTAGGTGA	3660
	ATATTCAAGT TTAGTTGCAG CTGACGTATT ATCATTTGAA GATGCAGTTA AAATTGTTAG	3720
40	AAAACGTGGT CAATTAATGG CGCAAGCATT TCCTACTGGT GTAGGAAGCA TGGCTGCAGT	3780
	ATTGGGATTA GATTTTGATA AAGTCGATGA AATTTGTAAG TCATTATCAT CTGATGACAA	3840
45	AATAATTGAA CCAGCAAACA TTAATTGCCC AGGTCAAATT GTTGTTTCAG GTCACAAAGC	3900
	TTTAATTGAT GAGCTAGTAG AAAAAGGTAA ATCATTAGGT GCAAAACGTG TCATGCCTTT	3960
	AGCAGTATCT GGACCATTC ATTTCATCGCT AATGAAAGTG ATTGAAGAAG ATTTTTC AAG	4020
50	TTACATTAAT CAATTTGAAT GGCGTGATGC TAAGTTTCCT GTAGTTCAAA ATGTAAATGC	4080
	GCAAGGTGAA ACTGACAAAG AAGTAATTAA ATCTAATATG GTCAAGCAAT TATATTCACC	4140
55	AGTACAATTC ATTAAC TCA CAGAAATGGCT AATAGACCAA GGTGTTGATC ATTTTATTGA	4200

	AACATCAATT CAAACTTTAG AAGATGTGAA AGGATGGAAT GAAAATGACT AAGAGTGCTT	4320
	TAGTAACAGG TGCATCAAGA GGAATTGGAC GTAGTATTGC GTTACAATTA GCAGAAGAAG	4380
5	GATATAATGT AGCAGTAAAC TATGCAGGCA GCAAAGAGAA AGCTGAAGcA GTAGTCGAAG	4440
	AAATCAAAGC TAAAGGTGTT GACAGTTTTG CGATTCAAGC AAATGTTGCC GATGCTGATG	4500
10	AAGTTAAAGC AATGATTAAA GAAGTAGTTA GCCAATTTGG TTCTTTAGAT GTTTTAGTAA	4560
	ATAATGCAGG TATTACTCGC GATAATTTAT TAATGCGTAT GAAAGAACAA GAGTGGGATG	4620
	ATGTTATTGA CACAACTTA AAAGGTGTAT TTAAGTGTAT CCAAAAAGCA ACACCACAAA	4680
15	TGTTAAGACA ACGTAGTGGT GCTATCATCA ATTTATCAAG TGTTGTTGGA GCAGTAGGTA	4740
	ATCCGGGACA AGCAAATAT GTTGCAACAA AAGCAGGTGT TATTGGTTTA ACTAAATCTG	4800
	CGGCGCGTGA ATTAGCATCT CGTGGTATCA CTGTAAATGC AGTTGCACCT GGTTTTATTG	4860
20	TTTCTGATAT GACAGATGCT TTAAGTGTAG AGCTTAAAGA ACAAATGTTG ACTCAAATTC	4920
	CGTTAGCACG TTTTGGTCAA GACACAGATA TTGCTAATAC AGTAGCGTTC TTAGCATCAG	4980
	ACAAAGCAAA ATATATTACA GGTCAAACAA TCCATGTAAA TGGTGGAATG TACATGTAAT	5040
25	ATATTTGAGC TAAAGCTCAT TGACGCAGTG GTTGACTGGT CATCCAATGG AGAATTGTCT	5100
	GACCTAGTCA ACTTTGCGGG GGAAATTCTA AGCAACCTAG ATAAGGTTC AGAATTTCTC	5160
30	CCTAAGAAAC ACTAATCAAT aAATTGWTA GTGTTTCTAA AATTTCTACT TGTTTTTTAG	5220
	AATTTAAAT GGGAAATAT AGTAGTCTAT GTATAGGCAT TTTTAAAGGA GGTGAATCGA	5280
	CGTGGAATAT TTCGATAAAG TAAAGATAT CATCGTTGAC CgTTTAGGTG TAGACGCTGA	5340
35	TAAAGTAACT GAAGATGCAT CTTTCAAAGA TGATTTAGGC GCTGACTCAC TTGATATCGC	5400
	TGAATTAGTA ATGGAATTAG AAGACGAGTT TGGTACTGAA ATTCCTGATG AAGAnGCTGA	5460
	AAAAETCAAC ACTGTTGGTG ATGCTGTTAA ATTTATTAAAC AGTCTTGAAA AATAATAAAT	5520
40	CTTACATCTG GGTCGTCAGT ATTGTCGACT CAGTTTTTTT CTTTAATTAT CAATAGTTTT	5580
	AACGTAAAT TAAAGATGAT TCAAGAGCAA CACATAAAGG AGATAAAATA ATGTCTAAAC	5640
	AAAAGAAAAG TGAGATAGTT AATCGTTTTA GAAAGCGCTT TGATACTAAA ATGACAGAGT	5700
45	TAGGCTTTAC TTATCAAAAT ATTGATTTAT ACCAACAGC ATTTTCGCAT TCGAGTTTTA	5760
	TTAATGATTT TAATATGAAT CGTTTAGACC ATAATGAGCG TTTAGAGTTT TTGGGTGATG	5820
50	CGGTATTAGA ATTGACGGTT TCACGATATT TATTTGATAa ACATCCCAAC TTGCCAGAAG	5880
	GGAATTTAAC AAAAATGCGT GCCaCTATTG TATGTGAGCC CtCACTkGTA ATATTTGCCA	5940
55	ATAAAATTGG ATTGAACGAA ATGATTTTAC TTGGTAAGG TGAAGAGAAA ACAGGGGGAC	6000

ATCAAGGACT AGATATAGTT TGGAAATTTG CTGAGAAAGT CATTTTCCCA CATGTAGAAC 6120
 AAAATGAGTT ATTAGGCGTG GTAGATTTTA AAACACAATT CCAAGAATAT GTGCACCAGC 6180
 5 AAAATAAAGG TGATGTAACC TATAATTTAA TAAAAGAAGA GGGACCGGCA CATCATCGTC 6240
 TATTCACTTC A 6251

(2) INFORMATION FOR SEQ ID NO: 26:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4920 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 15 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:

20 ACCTACTGAA GTTGCTAATT TTTTGGAGCA ACTAAGCACT GAAATTGAAC GTCTTAAAGA 60
 AGATAAAAAA CAACTTGAAA AAGTAATCGA AGAGAGaGAT ACTAATATTA AGTCTTATCA 120
 AGACGTGgCA TCAATCTGTA AGTgATGCTT TGATACAAGC TCAAAAAGCT GGTGAAGAAA 180
 25 CTAAGCAAGC TGCAGAGAAA CAAGCTGAAG CGATTATAGC TAAGGCAGAA GCGCAAgcTA 240
 ATcAAATGGT TGGTGACGCG GTAGAAAAAG CACGCCGTTT AGCATTCCAG ACTGAAGATA 300
 TGAAAACGTCA ATCAAAAAGTA TTTAGATCGC GTTTCCGTAT GTTAGTTGAA GCGCAATTAG 360
 ACTTATTAAA AAACGAAGAT TGGGATTACT TGTGTAATTA TGATTTAGAC GCTGAACAAG 420
 TGACGCTTGA AAATATTCAT CATTTGCATG AAAATGATTT AAAGCCAGAT GAAGTTGCAG 480
 35 CAAATGCACA AAATAATGCA TCAAAATACAC CAGACAATAA TCAACAATCC AATGATTCAG 540
 AAACAACATA GAAGTAAGAA TTAAATAAAG ACAGACGCGT AATATACATT TAACTTTTCA 600
 CAGCGAATTA GGTAATGGTG AGAGCCTAGT AAAAGCATGT ATGTTATATC ACTGGCTTTT 660
 40 TAATATTTAA ATAATGTAAT GAGAGAACTC TAAGTTGAGT TAATAAGGGT GGTACCGCGA 720
 GCAATCGTCC CTTTTAATTT AACTTAGAGT TTTTAAATT TTTAAGGAGT GAAAAAATG 780
 GATTACAAAG AACCGTTATT AATGCCTAAA ACAGATTTCC CAATGCGAGG TGGTTTACCA 840
 45 AACAGGAAC CGCAAATTCA AGAAAAATGG GATGCAGAAG ATCAATACCA TAAAGCGTTA 900
 GAAAAAATA AAGGTAACGA AACATTCAAT TTACATGATG GCCCACCATA CGCGAATGGT 960
 50 AACTTACATA TGGGACATGC CTTGAACAAA ATTTTAAAG ACTTTATTGT ACGTTATAAA 1020
 ACTATGCAAG GGTTCATGC ACCATACGTA CCAGGTTGGG ATACACATGG TTTACCAATT 1080
 GAACAAGCAT TAACGAAAAA AGGTGTTGAC CGAAAGAAAA TGTCAACAGC TGAATTCCGT 1140

EP 0 786 519 A2

	TTAGGTGTTT	GTGGTGACTT	TAATGATCCA	TATATTACAT	TAAAACCTGA	ATACGAAGCT	1260
	GCACAAATTC	GTATTTTTTG	AGAAATGGCA	GATAAAGGTT	TAATTTATAA	AGGTAAAAAG	1320
5	CCAGTTTATT	GGTCTCCTTC	AAGTGAGTCT	TCATTAGCAG	AAGCAGAAAT	TGAATATCAC	1380
	GATAAACGTT	CAGCATCAAT	TTACGTTGCA	TTTGACGTTA	AAGATGACAA	AGGTGTCGTT	1440
10	GATGCAGATG	CTAAATTTAT	TATCTGGACA	ACAACGCCAT	GGACAATTCC	ATCAAATGTT	1500
	GCGATTACCG	TTCATCCTGA	ATTAAAATAT	GGTCAATACA	ATGTAAATGG	cGAAAAATAT	1560
	ATTATTGCAG	AAGCCTTGTC	TGACGCTGTA	GCAGAAGCAC	TGGaTTGGGA	TAAAGCATCA	1620
15	ATCAAATTAG	AAAAAGAATA	CACAGGTAAA	GAATTAGAGT	ATGTTGTAGC	ACAACATCCA	1680
	TTCTTAGACA	GAGAATCGTT	AGTGATTAAT	GGTGATCATG	TTACTACAGA	TGCTGGTACA	1740
	GgTTGTGTAC	ATACAGCACC	AGGTCACGGG	GAAGATGACT	ATATTGTTGG	TCAAAAATAT	1800
20	GAATTGCCAG	TAATTAGTCC	AATCGATGAT	AAAGGTGTAT	TTACTGAAGA	AGGCGGCCAA	1860
	TTTGAAGGGA	TGTTCTATGA	TAAAGCTAAT	AAAGCCGTTA	CTGATTTATT	AACAGAAAAA	1920
	GGTGCACTAT	TAAAATTAGA	CTTTATTACA	CATAGCTATC	CACACGACTG	GAGAACAAAA	1980
25	AAACCTGTAA	TCTTCCGTGC	TACACCACAA	TGGTTTGCCT	CAATCAGTAA	AGTAAGACAA	2040
	GATATTTTAG	ATGCAATCGA	AAATACAAAC	TTCAAAGTAA	ATTGGGGTAA	AACACGTATT	2100
30	TACAAATATG	TTCGTGACCG	TGGCGAATGG	GTTATTTCTC	GTCAACGTGT	GTGGGGTGTA	2160
	CCGTTACCAG	TATTTTATGC	TGAAAATGGC	GAAATTATCA	TGACGAAAGA	AACAGTGAAT	2220
	CATGTTGCTG	ATTTATTTGC	AGAACACGGT	TCAAATATTT	GGTTTGAAAG	AGAAGCGAAA	2280
35	GACTTACTAC	CAGAAGGATT	TACACATCCA	GGCAGCCCTA	ACGGTACATT	TACTAAAGAA	2340
	ACAGACATTA	TGGACGTTTG	GTTTGATTCT	GGTTCATCAC	ACCGTGGCGT	GTTGGAAACA	2400
	AGACCGGAAT	TAAGTTTCCC	AGCGGATATG	TATTTAGAAG	GTAGTGACCA	ATATCGTGGT	2460
40	TGGTTCAACT	CTTCTATCAC	AACTTCAGTT	GCTACAAGAG	GAGTATCACC	TTATAAATTC	2520
	TTACTTTCTC	ATGGTTTTGT	TATGGACGGT	GAAGGTAAGA	AAATGAGTAA	ATCTTTAGGT	2580
	AATGTGATTG	TACCTGACCA	AGTGGTTAAA	CAAAAAGGTG	CTGATATTGC	GAGACTTTGG	2640
45	GTAAGTAGTA	CGGACTATTT	AGCTGATGTT	AGAATTTCTG	ATGAAATTTT	AAAACAAACA	2700
	TCTGATGTTT	ATCGTAAAAT	CAGAAATACA	TTAAGATTTA	TGTTAGGTAA	CATTAACGAT	2760
50	TTCAATCCTG	ACACAGATAG	CATTCCTGAA	TCAGAGTTAT	TAGAAGTGGA	TCGTTACTTG	2820
	CTAAATCGTT	TACGTGAATT	TACTGCAAGT	ACGATTAACA	ACTATGAAAA	CTTTGACTAC	2880
55	TTAAATATTT	ATCAAGAAGT	TCAAACTTTT	ATCAATGTTG	AGTTAAGTAA	TTTCTATTTG	2940

	CAAACAGTGT TATATCAAAT TTTAGTTGAT ATGACGAAGT TGTTCAGCACC AATCTTAGTG	3060
5	CATACAGCTG AAGAAGTTTG GTCTCATACA CCACATGTTA AAGAAGAAAAG TGTTCACTTA	3120
	GCAGACATGC CTAAAGTTGT AGAAGTAGAT CAAGCTTTAT TGGATAAATG GCGTACATTT	3180
	ATGAATTTTAC GTGATGATGT GAACCGTGCA TTAGAAACTG CTCGTAATGA AAAAGTTATT	3240
10	GGTAAATCAT TAGAAGCTAA AGTTACGATT GCTAGTAACG ATAAATTTAA TGCATCTGAA	3300
	TTCTTAACTT CATTTGATGC ATTACATCAA TTATTTATCG TGTCACAAAGT TAAAGTTGTA	3360
	GATAAGTTAG ACGATCAGGC AACAGCTTAT GAACATGGTG ATATTGTCAT CGAACATGCA	3420
15	GATGGTGAAA AATGTGAAAG ATGTTGGAAC TATTCAGAGG ATCTTGGTGC TGTTCATGAA	3480
	TTGACGCATC TATGTCCACG ATGCCAACAA GTTGTAATAAT CACTTGTATA ATTGAAATTG	3540
	TATAAAGTAC TCATACAGAT GATATAAATT AAAGCTCTCT TCATAATCAT GTTGTAGTTT	3600
20	TTGTTGACAT GATGAAGAGA GTTTTTTTGT GAATAAAAAA ATGACCAAGT TACCGGTCAT	3660
	ATATGTAAAA AATGTGCGAT TTAATAAAT AAAAATTATT CAGGAATGGT ACAAATTCTC	3720
25	TGAGGCATAT AAATGCGTTA TAGTTGCTAT TCTCAATTAT GTTCGCGATA ATTTTAAGTA	3780
	AAAGTAAGCA CAGATATTGA ATTTGATAGG AGTTAATTGA ATGTATCATA ACAGTAACGC	3840
	AAACTTTGTC AATGGTATCA CTTTAAATGT GAGAGATAAG AATGAATTAA AGCCATTTTA	3900
30	TGAGGACATA TTAGGATTAA ATATTATAAA TGAGACATTA ACATCGATAC AATATGAAGT	3960
	AGGTCAAAAT AATCATGTCA TTACACTTGT TGAATTACAA AATGGACGTG AACCTTTAAT	4020
	GTCCGAAGCG GGAAGTGTTC ATATCGCAAT TAAACTACCT CAAATTAGTG ATTTAGCTAA	4080
35	TTTACTAATT CATTTAAGCG AATATGATAT TCCAGTTAAC GGAGGTATAC AGCCTGCTTC	4140
	GTTATCATT ATTTTTGAAG ACCCGGAAGG AAACGGTTTT AAATTTTATG TTGATAAAGA	4200
	CGAAGCGCAA TGGACGAGGC AAAATAATTT AGTAAAAATT GATATTAGAC CATTAAATGT	4260
40	ACCGAGATTA GTGAGTCATG CAACAAAATT GTTATGGTTA GGTATTCCAG ATGACGCTAT	4320
	TATAGGTGCA TTGCATATTA AGACAATTCA TTTATCAGAG GTAAAAGAGT ACTACCTCGA	4380
45	TTATTTTGA TTAGAGCAAT CGGCATATAT GGATGATTAT TCAATATTTT TAGCATCGAA	4440
	TGGCTATTAT CAACATTTGG CCATGAATGA TTGGGTATCA GCAACGAAAC GTGTAGAAAA	4500
	TTTTGATACG TATGGATTAG CAATTGTTGA CTTTCATTAT CCTGAAACAA CACATTTAAA	4560
50	TTTACAAGGT CCGGATGGTA TCTATTATCG CTTTAATCAT ATCGAAGTTG AAGATTAGTA	4620
	TATACTTTGA ATGGACGAAC CATATAATGA ATCGTTTTTA ATGATCTTTT TATACAAGTT	4680
55	ATGAAGGAGG CTGGGACATT AAGTTCCTAG GCAATGTAAA AAGCTGATTT CTATTAATTA	4740

TTTTCTTAT ATTAATTGCC ATTAATACAA AACCTAGCTC TCGTTTAACT TTATTTATTC 4860
 CTCGAACTGA CATTTCGnGTG AACTCAAAAT nGCCTACTTn CTTAAATTAC CAATATCTAT 4920

(2) INFORMATION FOR SEQ ID NO: 27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 626 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27:

TGGATTGCCA TTACATGGAC AAGATTTAAC TGAATCAATT ACACCATATG AAGGTGGTAT 60
 CGCTTTTGCA AGTAAACCAT TAATTGATGC TGATTTTATT GGTAAATCTG TATTAAAAGA 120
 TCAAAAAGAA AATGGTGCAC CAAGAAGAAC AGTGGGATTA GAATTACTTG AAAAAGGAAT 180
 TGCAAGAACT GGTTATGAAG TTATGGATTT AGATGGAAAT ATTATTGGAG AAGTAACTTC 240
 AGGAACACAG TCTCCATCAT CAGGAAAATC AATTGCACTT GCAATGATAA AAAGAGATGA 300
 GTTTGAAATG GGTAGAGAGT TGCTTGTTC AAGTCGTAAG CGTCAATTAA AAGCGAAAAT 360
 TGTTAAGAAA AATCAAATTG ATAAATAATT AAAAAGGGGT GTGCATTGTG AGTCATCGTT 420
 ATATACCTTT AACTGAAAAA GACAAGCAAG AAATGTTACA AACAATTGGT GCAAAATCTA 480
 TAGGAGAATT ATTCGGTGAT GTACCAAGTG ACATTTTATT AAATAGAGAT TTAAATATTG 540
 CTGAAGGCGA ACGGAGAACA ACGTTACTTA GAAGATTnAA TCGCATTGCA AGCAAGAGTA 600
 TCACTAGAGG AACGCGTACA TCGTTT 626

(2) INFORMATION FOR SEQ ID NO: 28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1126 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:

nGGAAGTGGT GTATATATTT GTAATGAGTG TATTGAATTA TGCTCAGAAA TCGTCGAAGA 60
 AGAATTAGCT CAAACACTT CTGAAGCGAT GACAGAATTA CCTACTCCTA AAGAAATTAT 120
 GGATCATTTA AACGAATATG TTATTGGTCA AGAAAAAGCT AAAAAATCTT TAGCTGTAGC 180
 TGTTTATAAC CACTATAAGC GTATTCAACA ATTAGGACCA AAAGAAGATG ATGTTGAATT 240

AACCTTAGCC AAGACGTTGA ATGTACCATT TGCAATTGCA GATGCGACAA GTTAACTGA 360
 AGCTGGTTAT GTAGGCGATG ATGTTGAAAA TATCTTGTG AGATTAAATC AAGCAGCTGA 420
 5 CTTTGACATT GATAAAGCCG AAAAAGGTAT TATTTATGTA GATGAAATTG ATAAAATTGC 480
 ACGTAAATCT GAAAACACAT CTATAACACG TGACGTTTCA GGTGAAGGTG TTCAACAAGC 540
 10 ATTGCTTAAA ATCTTAGAAG GTACGACTGC AAGTGTTCG CCACAAGGTG GACGCAAACA 600
 TCCAAACCAA GAAATGATTG AAATGATAC AACAAATATC TTATTTATTC TTGGTGGTGC 660
 CTTTGATGGT ATTGAAGAAG TGATTAAGCG CCGTCTTGGT GAAAAAGTTA TTGGTTTCTC 720
 15 AAGCAATGAA GCTGATAAAT ATGACGAACA AGCATTATTA GCACAAATC GCCCAGAAGA 780
 TTTGCAAGCC TATGGTTTGA TTCCTGAATT TATCGGACGT GTGCCAATTG TAGCTAATTT 840
 AGAAACATTA GATGTAAC TGTTGAAAA CATCTTAACG CAACCTAAAA ATGCACTTGT 900
 20 GAAACAATAT ACTAAATGC TGAATTAGA TGATGTGGAT TTAGAGTTCA CTGAAGAAGC 960
 TTTATCAGCA ATTAGTGAAA AAGCAATTGA AAGAAAAACA GGTGCGCGTG GTTTACGTTT 1020
 AATCATAGAA GAATCGTTAA TCGATATTAT GTTTGATGTG CCTTCTAACG AAAATGTAAC 1080
 25 GAaGGTAGTT ATTACAGCAC AAACmATTAA TGrAGaACTG AACCAG 1126

(2) INFORMATION FOR SEQ ID NO: 29:

30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 4392 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

40 ATTGACTTCT TAGCAAThAA TaTGAGTGAA GAACGTACTG TTGAAGTACC AGTTCAATTA 60
 GTTGGTGAAG CAGTAGGCGC TAAAGAAGGC GCGTAGTTG AACCAACCATT ATTCAACTTA 120
 GAAGTAACTG CTACTCCAGA CAATATTCCA GAAGCAATCG AAGTAGACAT TACTGAATTA 180
 45 AACATTAACG ACAGCTTAAC TGTGCTGAT GTTAAAGTAA CTGGCGACTT CAAAATCGAA 240
 AACGATTCAG CTGAATCAGT AGTAACAGTA GTTGCTCCAA CTGAAGAACC AACTGAAGAA 300
 GAAATCGAAG CTATGGAAGG CGAACAACAA ACTGAAGAAC CAGAAGTTGT TGGCGAAAGC 360
 50 AAAGAAGACG AAGAAAAAAC TGAAGAGTAA TTTTAATCTG TTACATTAAA GTTTTTATAC 420
 TTTGTTTAA CAGCACTGTG CTTATTTTAA TATAAGCATG GTGCTTTTTG TGTTATTATA 480
 AAGCTTAATT AAACCTTTATT ACTTTGTACT AAAGTTTAAT TAATTTTAGT GAGTAAAAGA 540

55

	CTTACTAAGC TAAAGAATAA TGATAATTGA TGGCAATGGC GGAAAATGGA TGTTGTCATT	660
	ATAATAATAA ATGAAACAAT TATGTTGGAG GTAAACACGC ATGAAATGTA TTGTAGGTCT	720
5	AGGTAATATA GGTAAACGTT TTGAACCTTAC AAGACATAAT ATCGGCTTTG AAGTCGTTGA	780
	TTATATTTTA GAGAAAAATA ATTTTTCATT AGATAAACAA AAGTTTAAAG GTGCATATAC	840
10	AATTGAACGA ATGAACGGCG ATAAAGTGTT ATTTATCGAA CCAATGACAA TGATGAATTT	900
	GTCAGGTGAA GCaGTTGCAC CGATTATGGA TTATTACAAT GTTAATCCAG AAGATTTAAT	960
	TGTCTTATAT GATGATTTAG ATTTAGAACA AGGACAAGTT CGCTTAAGAC AAAAAGGAAG	1020
15	TGCGGGCGGT CACAATGGTA TGAAATCAAT TATTAAAATG CTTGGTACAG ACCAATTTAA	1080
	ACGTATTCGT ATTGGTGTGG GAAGACCAAC GAATGGTATG ACGGTACCTG ATTATGTTTT	1140
	ACAACGCTTT TCAAATGATG AAATGGTAAC GATGGAAAAA GTTATCGAAC ACGCAGCACG	1200
20	CGCAATTGAA AAGTTTGTGG AAACATCAGG ATTTGACCAT GTTATGAATG AATTTAATGG	1260
	TGAAGTGAAA TAATGACAAT ATTGACAACG CTTATAAAAG AAGATAATCA TTTTCAAGAC	1320
25	CTTAATCAGG TATTTGGACA AGCAAACACA CTAGTAACTG GTCTTTCCCC GTCAGCTAAA	1380
	GTGACGATGA TTGCTGAAAA ATATGCACAA AGTAATCAAC AGTTATTATT AATTACCAAT	1440
	AATTTATACC AAGCAGATAA ATTAGAAACA GATTTACTTC AATTTATAGA TGCTGAAGAA	1500
30	TTGTATAAGT ATCCTGTGCA AGATATTATG ACCGAAGAGT TTTCAACACA AAGCCCTCAA	1560
	CTGATGAGTG AACGTATTAG AACTTTAACT GCGTTAGCTC AAGGTAAGAA AGGGTTATTT	1620
	ATCGTTCCTT TAAATGGTTT GAAAAAGTGG TTAACCTCTG TTGAAATGTG GCAAAATCAC	1680
35	CAAATGACAT TGCCTGTTGG TGAGGATATC GATGTGGACC AATTTCTTAA CAAATTAGTT	1740
	AATATGGGGT ACAAACGGGA ATCCGTGGTA TCGCATATTG GTGAATTCTC ATTGCGAGGA	1800
	GGTATTATCG ATATCTTTCC GCTAATTGGG GAACCAATCA GAATTGAGCT ATTTGATACC	1860
40	GAAATTGATT CTATTCGGGA TTTTGATGTT GAAACGCAGC GTTCCAAAGA TAATGTTGAA	1920
	GAAGTCGATA TCACAACTGC AAGTGATTAT ATCATTACTG AAGAAGTGAT CAGCCATCTT	1980
45	AAAGAAGAGT TAAAACTGC ATATGAAAAT ACAAGACCCA AAATAGATAA ATCAGTGC GC	2040
	AATGATTTGA AAGAAACGTA TGAAAGCTTT AAATTATTCG AAAGTACATA CTTTGATCAT	2100
	CAAATACTAC GTCGCTTAGT AGCGTTTATG TATGAAACAC CTTGACAAT TATTGAGTAT	2160
50	TTCCAAAAG ATGCAATCAT TGCAGTTGAT GAATTTAATC GTATTAAAGA AACTGAAGAA	2220
	AGTTTAAACAG TAGAGTCTGA TTCGTTTATT AGCAATATTA TTGAAAGTGG TAATGGATTT	2280
55	ATAGGACAAA GTTTTATAAA ATATGATGAT TTTGAAACAT TGATTGAAGG CTATCCTGTC	2340

EP 0 786 519 A2

	TCATGTAAAC CTGTCCAACA ATTTTATGGG CAATATGACA TTATGCGTTC TGAATTTCAA	2460
	CGATATGTTA ATCAAACTA TCATATCGTG GTTTTGGTCG AAACCGAAAC TAAAGTTGAA	2520
5	CGTATGCAAG CGATGTTAAG TGAAATGCAT ATTCCATCAA TAACAAAATT GCATCGCTCA	2580
	ATGTCATCGG GGCAAGCAGT GATTATTGAA GGCAGTTTAT CTGAAGGATT TGAACCTACCT	2640
10	GATATGGGAT TAGTTGTCAT TACTGAGCGT GAgcTTTTTA AATCAAAACA GAAAAAGCAA	2700
	CGAAAAACGTA CGAAAGCTAT CTCAAATGCT GAAAAAATTA AGTCTTACCA AGATTTAAAT	2760
	GTGGGAGATT ATATTGTTCA TGTGCATCAT GGTGTTGGTA GATATTTAGG TGTTGAGACG	2820
15	CTCGAAGTGG GGCAAACGCA TCGTGATTAT ATTAAATTGC AATATAAAGG TACGGATCAA	2880
	CTATTTGTTT CAGTAGATCA AATGGATCAA GTTCAAAAAT ATGTAGCTTC GGAAGATAAG	2940
	ACGCCAAAAT TAAATAAACT CGGTGGCAGT GAATGGAAAA AAACAAAAGC TAAAGTTCAA	3000
20	CAAAGTGTTG AAGATATTGC TGAAGAGTTG ATTGATTTAT ATAAAGAAAG AGAAATGGCA	3060
	GAAGGTTATC AATATGGGGA AGACACAGCT GAGCAAACAA CATTTGAATT AGATTTTCCA	3120
25	TATGAACTTA CGCCTGACCA AGCTAAATCT ATCGATGAAA TTAAAGATGA CATGCAAAAA	3180
	TCGCGTCCAA TGGATCGCTT GCTATGTGGT GATGTTGGTT ATGGTAAAC TGAAGTTGCA	3240
	GTGAGAGCAG CATTCAAAGC TGTAATGGAA GGAAAGCAGG TTGCATTTTT AGTTCCTACA	3300
30	ACTATTTTAG CTCAGCAACA TTATGAGACG TTAATTGAGC GTATGCAAGA TTTTCCTGTT	3360
	GAAATTCAAT TAATGAGTCG TTTTAGAACG CCTAAAGAGA TAAACAAAC TAAGGAAGGA	3420
	CTTAAAACTG GATTTGTTGA CATAGTTGTT GGTACACACA AATTACTTAG TAAAGATATA	3480
35	CAGTATAAAG ATTTAGGGCT GTTGATTGTA GATGAAGAAC AACGATTTGG TGTACGCCAT	3540
	AAAGAGCGTA TTAACCAATT AAAACATAAT GTAGATGTAC TAACATTGAC TGCAACCCCA	3600
	ATAGCTAGAA CATTGCATAT GAGTATGCTA GGTGTGCGGG ATTTGTCAGT GATTGAAACG	3660
40	CCGCCAGAAA ATCGTTTCCC AGTTCAAACA TATGTATTAG AACAGAACAT GAGTTTATC	3720
	AAAGAAGCTT TAGAAAGAGA ACTATCCCGT GATGGCCAAG TGTTTTATCT TTATAATAAA	3780
45	GTGCAATCCA TTTATGAAAA ACGAGAACAA CTCCAGATGT TAATGCCAGA TGCTAACATT	3840
	GCAGTTGCTC ATGGACAAAT GACAGAGCGC GATTTAGAAG AAACGATGTT AAGTTTATC	3900
	AATAATgAAT ATGATATTTT AGTAACGACG ACGATTATTG AAACAGGTGT CGATGTCCCA	3960
50	AATGCAAATA CTTTGATCAT TGAAGATGCA GATCGCTTTG GATTGAGTCA GTTGTATCAA	4020
	TTAAGAGGTC GTGTTGGTCG TTCAAGTCGT ATTGGTTATG CATACTTCTT ACATCCAGCA	4080
55	AATAAGGTAC TAACTGAGAC TGCAGAAGAT CGATTACAAG CGATTAAAGA ATTTACGGAG	4140

TTAGGTAAAC AACAGCACGG CTTTATTGAT ACAGTTGGAT TTGATTTGTA CAGTCAAATG 4260
 TTAGAAGAAG CTGTAAATGA AAAACGTGGT ATTAAGGAAC CAGAATCTGA GGTGCCAGAA 4320
 5 GTCGAAGTTG ATTTAAACTT GGATGCATAT TTGCCAACAG AATATATTGC AAATGAACAA 4380
 GCTAAAATTG AA 4392

(2) INFORMATION FOR SEQ ID NO: 30:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 729 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 15 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

20 TTTCTTTTGA ATCTATATCG AGGTGGTTGG TAGGTTTCATC TAAAATAAGT ACATTGTCAC 60
 GTTGCAACAT AAGTAGTGCT AGTTGTAAAC GTGCTTTTTC ACCACCAGAT AAATCATTAA 120
 25 TTATCTTTTT AACATCGTCT TGTACAAATA AGAAACGTCC AAGAACTGCT CGAATATCTT 180
 TTTCAATTCAT TAACGGATAT TGATCCCACA CATAATCTAA AATCGTTTTA CTAGATTTAA 240
 ATTCTGCTTG CTTTTGATCA TAATAACCAA TTTGTAAATT TGCGCCGAAA GTAATATCGC 300
 30 CATTAAAGCGC TTTTGTGTA TTAGCAATAG TTTTAATTAA GGTCGATTTT CCAATACCAT 360
 TTGGCCCAAT GATTGCTATA TGATCGCCTT TAGAGACCTC TATACTCATA GGTTTGGTAA 420
 TTGCAGTTTG ATAACCGATT TCTAAATTTT TTACATGCAT GACGTCATTA CCTGTATTCC 480
 35 GGTCAAAGCC AAATTGAATA TTTGCACTTT TGGCATCTAA CATTGGTTTA TCAATGCGTT 540
 CCATTTTTTC TAAAATCTTA CGTCTACTTT TTGCCATTCC ACTTGTTGAA GCACGGGTAA 600
 TATTTTCTC AACAAAAGTT TCTAATCGTT TTATTTCTGC TTGTTGACTT TCATATTCTT 660
 40 GCATTCGTTT TTGATAATAT AAATCCCGTT GCTGTATAAA TTCCTCGTAA TTACCAACAT 720
 AGCGTTTGA 729

(2) INFORMATION FOR SEQ ID NO: 31:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 13856 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 50 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 31:

	TGATGTTTCG ATACATTTGT TGCACCTTGT GGATATACTT TAAAGGTTGT GTCGTATGTT	120
	TCCTTACTAT CTTTAGCTTC AGATTCCTGT GATTCAACCG TTTTATATTT TTCAAGTGCA	180
5	TGTCCTTCAA TATCAACTCG TGAATAATG CGATTCAACC ATGCTGGTAA ATACCACGAA	240
	CCTTTtCCAA ACAATTTCGt TAATGCAGGA ATTAACATCA TtCTGACTAC GAAGGCATCA	300
10	AAGAGTACAC CAAACGCTAA TGCCATACCC ATTGATTTAA TCATGACATC TTCTTGGAAT	360
	ACAAACGCAA AGAAGACACT AAACATAATT AATGCAGCTG CTACAATAAC AGGACCGCTT	420
	TCTTTCAATC CTACTTTGAT AGAATAATCA TTATCCCCTG TTTTACTATm yyCTTCATGr	480
15	ATTCGCGACA TAAGGAAGAC TTCATAATCC ATCGCTAATC CAAATAAGAT ACCTATAGTA	540
	ATAACCGGTA AAAATGCTAG CATTGGTCCT GTCGTTTCAA TACCAAACAG ACCTTTCATA	600
	AAACCATCTT GCATTACTAA TGTTGTAAAT CCTAATGTTG CCATTAAATGA CAAGACGAAT	660
20	CCTAAAACTG CTTTAAATGG TATTAGAATT GAACGGAAGA CAATCATTAA TAAGAAAAAT	720
	GCTAATACAA CAATGACTGA GGCAAATAAA GGTATCGCCT CATTTAACTT TTTAGACATA	780
25	TCAATATTAA TGACACTTTG TCCCGAAATC TCCGTTTTGA ACCCATATTT ATCTTGTGCA	840
	TCTTTATGAT AATCTCGTAA ATCATGCACT AAATCATTTG TACTCTCTGC ATTAGGCCCT	900
	TGCTTAGGTA TCACGACCAT CAAAGCGTAA TCATTATCTT TACTCATTTG TGGTGGCGTA	960
30	ACGATATCTA CATTTTTCTT ATCTTTAATA TCTTTATATA CAGACTGTAA ATCTTGTGTG	1020
	AATCCTGTG GATCATCCTT TTTATCTTTC ACATTTATCA ACATCGGTAT TTGGCCATTA	1080
	AATCCTTCAC CAAATTTATC CGAGATAATA TCGTAAGCTT TTTTCTGTGT AGAATCTGCT	1140
35	GGTTTAAACAC CGTCATCTGG AATACCAAGT CGCATATGAC TAACTGGTAT TGCAGCTGCT	1200
	ACTAATATGA TTAAACCTAG TAATACTGCC GCAAGTGCAT TTCCTGTAAT AAATTTAGAC	1260
	CATGGCGTAT CAATATCTTT TTTGAATTTA GACTGTAATT TATTCACTTT AATGCGTTtA	1320
40	TGGAAAATGC TTATTAATGC AGGTAATAAA GTTAAAGCGC TAAGTACTGC AAAACAACA	1380
	CTAATTGCCG AAGCAAATCC CATTACCGCT AAGAAGTCAA TGCCTACTAA TGATAAACCA	1440
45	CATACTGCAA TTACAACTGT TACACCAGCA AAAACAACCTG CACTACCTGC TGTTCTTATT	1500
	GCAAGACCAA TGCCTTTAAT GTAATCTGTT TCAGTTTTCA TAACTTGTCG ATATCTGAAT	1560
	AAAATAAATA ATGCATAATC GATACCAACT GCTAGTCCAA TCATTACGGC TAATGTCAGT	1620
50	GTGACATTTG GTATATCGAA TGCATAAGTT AACAACTGA TAATACCTAC ACCAGAGGCT	1680
	AGACCAATCA ATGCACCTAT AATTGGTAAT CCTGCAGCAA TGACTGAACC GAATGTGATT	1740
55	AACAGTACAA CAAATGCAAC AATAATACCA ACTAGTTCAG AATTACCGCC TACTTCTGTA	1800

	AAATGACTTT TAACATTATC TCTAGAGCCA TCTTTTAAAG ATGTTTGACT AACGTCATAT	1920
	GTGATATCTG CAAATGCAGT TGTTTTATCT TTAATAATT GCTTATTTTC ATAAGGATCT	1980
5	GATATTTTAT CAATGTGCTT GTCATCTTTT TTAATATCAT CTAACGTTTT CTTAATATCT	2040
	TTAGTAATGT TCGGTGCGAC AATACCATCA TCTTTAGTCG TCTTAAAGAC AACACGTATT	2100
10	TGTGCCTTTT CACTATCTTG ATTAATAATGT TTTTCAATCT TTTTATTCGT ATCTAACGAC	2160
	TCTAATCCTG TCATTTTAAAT ATCATTGTCA AATTTGCGTG CATTTGTAGC AAGTGGTATC	2220
	AATATTGCAG CTACAATCAC TATCCATGCA ATGACCGCGG ACCATTTATG TTTTGCGATG	2280
15	AATGTCCCCA TCTTATATAA AAATTTTGCC AAAGTATATT GCCTCCTTTT AAAATCAACG	2340
	TTATAGTTTA AATATACAGT GTAGATTATT GTTCGATTAT AGTATCTATC CCCGACCTCT	2400
	TAAAGAATCA ATTGGAAAAT TTTGTATATT AAACACACA CAAAGGAGAA ATGTAGATGA	2460
20	AAGAGACTGA TTTACGAGTT ATAAAGACAA AAAAAGCATT GTCGAGTAGC TTGCTACAAT	2520
	TGTTAGAACA GCAATTATTC CAAACGATTA CTGTCAATCA AATTTGCGAC AACGCACTCG	2580
25	TACACCGTAC AACATTTTAT AAACATTTT ATGATAAATA TGATCTTCTA GAGTACTTGT	2640
	TCAATCAATT GACTAAAGAC TACTTTGCTA GAGATATCAG TGACCGTCTT AATCATCCAT	2700
	TCCAAACGAT GAGTGATACG ATTAATAATA AAGAGGATTT GAGAGAAATC GCAGAATTCC	2760
30	AAGAAGAAGA CGCTGAATTT AATAAAGTAT TAAAAAATGT CTGCATTAAA ATTATGCATA	2820
	ACGATATCAA AAATAATAGA GACCGTATCG ATATTGACAG CGACATCCCA GATAATCTCA	2880
	TATTTTATAT TTATGACTCG TTGATTGAAG GTTTTATACA TTGGATAAAA GATGAAAAAA	2940
35	TTGATTGGCC TGGCGAAGAT ATTGATAACA TTTTCCATAG ATTAATCAAT ATTAAGATTA	3000
	AATAGTAGAT GAGAAACTCA TGAGCGTTAC CAACATTCAT AATAAAAACG ATAGTGKACA	3060
40	CGTTAATGAA TTCGTGTA CTATCGTTT TTTATTTTTA TCGTGCTTAT CGCTATTAAA	3120
	ACAACTGATA CACAACACAT AAACATGAA GAAAAAATA AATCCGCTAT CTAAATGACT	3180
	TTGACTCAGT TGTTTAAATG ACCAAATTGC TAATACAATT CCCATTATTA TTGAAATAAC	3240
45	GTATCTCACA TTCTTATACC TATAATCCTT TTCTAAAAAT ATGGTTGCTA TTACTTAATT	3300
	TTTAAAGTTA TAAATAAAAA GAGCCAACCG CAATGGATGG CCCTTGTTCA TTATGAAGCA	3360
	TTAGAACATT TCTGAAACAA CCTTTTGTTT TAAGAAGTGT AATAAGTAGT CTGGACTACC	3420
50	TGTTTTAGCG TCCGTACCTG ACATTTTGAA ACCACCAAAT GGATGGTATC CAACAACGTC	3480
	TGAAGTACAG CCTCTGTAA GGTATAAATT GCCTACATCA AATTCGTTTA CCGCTTTAAT	3540
55	CCAATGCTCG CGATTATTTG TAATCACTGC ACCAGTTAAA CCGTAATCTG TATCATTTGC	3600

EP 0 786 519 A2

	TTCTTCTTGC ATGATTCTAT CTTTAGATT AAGTCCTGAA ATGATTGTTG GTTCTACAAA	3720
	GTAACCTTTT GAATCATCAG TGCCGCCACC TTGTTCTAAT TTACCTTCTT CTTTACCAAT	3780
5	CTCAATATAA TTTTAAATCT TATCAAATG TTTTTTATTA ATAACGGGC CCATATACGT	3840
	ATTGTCTACA GTATTGCCA ACGTTAATTC TTTTGTTAAT TTGATTGATT TCTCTAATAC	3900
10	TTCGTCATAA ACGTCTTTAT GCACAATTGC ACGTGAACAT GCTGAACATT TTTGACCAGA	3960
	AAAACCAAAT GCTGACGTTA CAATAGCTTC TGCTGCCATA TCTGTATCAA TATTTTCATC	4020
	AACTACAATG GCATCTTTAC CACCCATTTT AGCGATAACA CGTTTCAAGA AGTTTTGACC	4080
15	TTCTTGAACA ACGGCACTAC GTTCATAAAT TCTAGTACCT GTCGCACGTG ATCCTGTAA	4140
	TGTAACGAAA TCGGTATCTT TATGATCAAC TAAGTAATCA CCAATTTCTT TCGGATCACC	4200
	AGGAACAAAG TTAACACGC CTTTTGGTAA TCCTGCTTCT TCTAAAATTT CCATTAATTT	4260
20	ATAAGCGATA TAAGGTGTAT CCTCAGCAGG TTTCAATAAC ACTGTATTAC CTGCCACAAC	4320
	TGGTGCTAAA GTTGTACCAG CCATAATCGC AAACGGGAAG TTCCACGGCG GAATTGTAAC	4380
	ACCTGTACCA ATTGATTTAT AGAAATATTT ATTGTGTTCA CCTTCACGAT CAAGTACTGG	4440
25	CTTACCTTGA GCCAAGTCCA TCATTGAACG TGCATAGTAT TCAATAAAAT CAATACCTTC	4500
	AGCTGCATCA CCAACTGCTT CATCCCATGG CTTACCTGCT TCATAAACCA TAATTGCTGC	4560
30	AATTTCCGCT TTTCGACGAC GAATAATTGC CGAAACACGT AACATAAGCT CTGCACGATC	4620
	ATTTGCTGAC CATGTTTTCC AAGATTTATA AGCTTCGTTT GCTGCTTTAA ACGCATCTTC	4680
	AACATCTTGT TTTGTTGCCT TTGATGCATT TGCAATCACT TGTGATGTGT CTGCAGGATT	4740
35	GATTGATTTA ATTTTGTCT CTTTGAAAAT CTTCTCTCCA TTAATCACTA ATGGTATGTC	4800
	TTGACCTAAT TCTTTTTCCA CGTCTTTCAA TGCTTTCTTA AACATATCCA CATTTTCTTG	4860
	GACTGAAAAA TCGTAACCAG GTTCATTTTT AAATTCTACT ACCATGTACA CTTACCCCCT	4920
40	ATAAATTTTG AAAGTGGTTT AACCCTTTGA TTTAATGATA TAACATCATT TAAACTCATT	4980
	TTACTATGAT TAAGGTTAGT TTTGCAATCG CTTTCATTTT TATGTTTTAT CACTTATTCT	5040
45	CAAGTATTTT GAAATTGATT GGTACTTTT TAAATTTTAT ATGGGTCGCA ACTGCTACTT	5100
	TATCGTTTCG TCATTTAATG TTTCCGATGG TAGGTCATTA TCAATTTTAC GAACGACTTT	5160
	ACAAGGGTTT CCAACCGCTA AGCTGTGTGG CGGAATATCT TTAGTGACAA CACTACCAGC	5220
50	ACCAATCACA CTGCCCTTCT CAATCGTCAC CCCTGGTAAC ACGGCTACAT GACCGCCAAA	5280
	CCAAGTATTA CTGCCAATAT GAATGGGTCC GGCTTTTTCA AAACCTTCAT TTCTATGATG	5340
55	GAAATTAAGT GGATGTGTCG CTGTGTAGAA TCCACAATTA GGTCTTATAA AAACATTATC	5400

	TCCTAGTTTA	ACGTTCCAAC	CATAATCTGT	ATCAAAAGGA	ATCGAAATAC	TTACATTGTC	5520
	TGTTGTTGTT	TGAAATAATT	GATCAATTAA	TTCCTTTCTT	TTATTTGTAG	CACTCGGTCT	5580
5	TGTATGATTT	AATTCAAAGC	AAATATCTTT	CGCTCGTGCA	CGTTCATTGA	TTAAGTATTG	5640
	ATCAAAGTTT	GCATCGTACC	ATTTTTCTGC	TAACATTTT	TCTTTTTCAG	TCATTACACC	5700
10	TTTCAACTCC	TAATAACTTA	TTTACTTGTT	TAAAAGTTAA	TCAAATAAAC	CTTCGCCTAT	5760
	GCAACTAATA	CGCTATAACA	TTATGAAATC	ATGACCTTAT	CACCCTTATC	TATACAATTC	5820
	TCGCATCAAA	TACTGCTAAA	GTAGTAGATA	AATTCAATAC	TACAGACGCA	TTCATTTTTT	5880
15	AATCTATTAA	CGTACAATGT	GAGTAAGAGA	AATATAAAGG	AGTATGATAG	CGATGAGAAT	5940
	ATTAATTACA	GGCACAGTTG	CTATCTTAAT	CATTCTAGGT	TTGGTCAAAA	CGATACAAGA	6000
	TTACGAAATG	ACAAACGACA	CGAGTCGTCA	GTTGTCAGAC	AACAAAGATG	ATGATAAAGT	6060
20	CATCCATCTT	AATAATTTTA	AAAATTTACA	TGCGAAAGAA	TTTAACCCAT	CTGATTTCTT	6120
	TTAAGTCACC	TAAGAATTGC	AAATCCAGAA	GTCATTTAAG	TTTTACCTTT	CATTCATACA	6180
25	TCCTTTAATA	TTAATTACGA	CTTCTTTTAT	ATAGATGCTA	AGTAGAGAGA	TTGTTGTGCA	6240
	ATGTTTGCAC	GGCAATCTCT	CTTTTCTTTT	TTAAATTTGG	TAAAAGTAAA	ACGCAACGAT	6300
	TGACTTATAT	ACCTATAGGG	GGTACATTAG	ACGTGTAACA	ATGAATCACA	GGGAGGCAAT	6360
30	AATGTGGCTA	ATACGAAAAA	AACAACATTA	GATATCACTG	GTATGACTTG	TGCCGCATGT	6420
	TCAAATCGTA	TCGAAAAGAA	ACTGAATAAA	CTTGATGACG	TTAATGCCCA	AGTGAATTTA	6480
	ACTACAGAGA	AAGCAACTGT	TGAGTATAAC	CCTGATCAAC	ATGATGTCCA	AGAATTTATT	6540
35	AATACGATTC	AACATTTAGG	TTACGGTGTC	GCTGTAGAAA	CTGTGGAATT	AGACATTACA	6600
	GGTATGACTT	GTGCTGCATG	CTCAAGCCGT	ATTGAAAAAG	TGTTAAATAA	AATGGACGGC	6660
	GTTCAAAATG	CAACGGTCAA	TTTAACAACA	GAGCAAGCTA	AAGTTGACTA	TTATCCTGAA	6720
40	GAAACAGATG	CTGATAAACT	TGTCACCTGC	ATTCAAAAAT	TAGGTTATGA	CGCGTCTATT	6780
	AAAGATAACA	ATAAAGATCA	AACGTCACGC	AAAGCTGAAG	CGCTACAACA	TAAATTGATT	6840
45	AAGCTTATCA	TATCAGCAGT	ATTATCTTTA	CCACTATTAA	TGTTAATGTT	TGTACATCTT	6900
	TTCAATATGC	ATATACCAGC	ACTATTTACG	AATCCATGGT	TCCAATTTAT	TTTAGCTACA	6960
	CCTGTACAAT	TTATTATTGG	ATGGCAATTT	TATGTAGGTG	CTTATAAAAA	CTTAAGAAAT	7020
50	GGTGGCGCCA	ATATGGATGT	ACTTGTGTCT	GTTGGTACAA	GTGCAGCATA	TTTTTACAGT	7080
	ATTTATGAAA	TGGTTCGTTG	GCTAAATGGC	TCAACAACGC	AACCGCATTT	ATACTTTGAA	7140
55	ACAAGCGCCG	TACTAATTAC	CTTAATCTTA	TTCGGTAAGT	ATTTAGAAGC	TAGAGCGAAG	7200

EP 0 786 519 A2

	TTAAAAGATG	GTAATGAAGT	GATGATTCCCT	CTAAATGAAG	TACATGTTGG	AGATACACTT	7320
	ATCGTTAAAC	CAGGTGAAAA	GATACCTGTT	GATGGCAAAA	TTATTAAAGG	TATGACTGCC	7380
5	ATCGACGAAT	CTATGTTAAC	AGGTGAATCT	ATCCCTGTG	AGAAGAATGT	TGATGATACT	7440
	GTAATTGGTT	CAACGATGAA	CAAAAACGGT	ACTATTACTA	TGACAGCAAC	AAAAGTTGGC	7500
	GGGACACTG	CGTTGGCAA	TATTATTAAA	GTTGTCGAAG	AAGCTCAAAG	TTCTAAAGCG	7560
10	CCGATTCAAC	GATTGGCAGA	TATTATTTCT	GGTTATTTCT	TTCCTATCGT	TGTTGGTATC	7620
	GCACTATTAA	CATTTATCGT	GTGGATTACT	TTAGTTACAC	CAGGTACATT	TGAACCTGCA	7680
	CTTGTTGCGA	GTATTTCCGT	TCTCGTCATT	GCTTGTCAT	GCGCATTGGG	ACTTGCTACA	7740
15	CCAACTTCTA	TTATGGTAGG	TACTGGTCGC	GCTGCTGAAA	ATGGTATTTT	ATTTAAAGGT	7800
	GGCGAGTTTG	TTGAACGCAC	ACATCAAATT	GATACCATCG	TTTTAGATAA	GACGGGTACC	7860
20	ATTACAAATG	GTCGTCCAGT	CGTGACAGAT	TATCATGGTG	ACAATCAAAC	GCTACAACATA	7920
	CTTGCTACTG	CTGAAAAAGA	TTCTGAACAC	CCATTGGCAG	AAGCCATTGT	CAATTATGCA	7980
	AAAGAAAAGC	AATTAATATT	AACTGAGACA	ACAACATTTA	AAGCAGTACC	TGGCCATGGT	8040
25	ATTGAAGCAA	CGATTGATCA	TCACCATATA	TTGGTTGGTA	ACCGTAAATT	AATGGCTGAC	8100
	AATGATATTA	GCTTGCCTAA	GCATATTTCT	GATGATTTAA	CACATTATGA	ACGAGATGGT	8160
	AAAACCTGCTA	TGCTCATTGC	TGTTAATTAT	TCATTAACTG	GTATCATCGC	AGTGGCAGAT	8220
30	ACTGTCAAAG	ATCATGCCAA	AGATGCTATA	AAACAATTGC	ATGATATGGG	CATTGAAGTT	8280
	GCCATGTTAA	CTGGCGATAA	TAAAAACACT	GCTCAAGCCA	TTGCAAAACA	AGTAGGCATA	8340
35	GATACTGTTA	TTGCAGATAT	TTTACCAGAA	GAAAAAGCTG	CACAAATTGC	GAAACTACAG	8400
	CAACAAGGTA	AGAAGGTTGC	GATGGTTGGT	GACGGTGTA	ATGATGCACC	TGCATTAGTT	8460
	AAAGCTGATA	TCGGTATCGC	CATTGGTACA	GGTACAGAAG	TTGCCATTGA	AGCAGCTGAT	8520
40	ATTACTATTC	TTGGTGGCGA	CTTGATGCTT	ATTCCTAAAG	CCATTTATGC	AAGTAAAGCA	8580
	ACCATTTCGTA	ATATTTCGTA	AAATCTATTT	TGGGCATTTC	GCTATAATAT	TGCCGGTATC	8640
	CCTATAGCTG	CATTGGGCTT	ACTTGCGCCA	TGGGTTGCTG	GTGCTGCAAT	GGCACTAAGT	8700
45	TCAGTAAGTG	TTGTCACAAA	CGCACTTAGA	TTGAAAAAGA	TGCGATTAGA	ACCACGCCGT	8760
	AAAGATGCCT	AGATTCTTTA	ATAATGAAGG	ATTCGTTGGT	GATTCTGAGA	TAGGCTAGTG	8820
50	ATTGGCTCTA	TAATGTCGCG	GTTTAYaGTt	GGATCTTCGC	TCCAAC TGCA	TATATAGTna	8880
	CACTTTTCGC	TTGGCGAATT	AGTGTATCTT	ACCTAATAGc	TCCGCCTATT	AGGTTCCATC	8940
	ATTATTATAA	ATAATAAGTA	CACTACGGtT	TACAGTTGGA	TCTTCGCTCC	AACTGCATAA	9000

	GAAATTTTAA ATGTTGAAGG TATGAGCTGT GGTCACTGCA AAAGTGCTGT TGAATCTGCA	9120
	TTAAATAATA TTGACGGTGT CACTTCAGCT GACGTTAACC TTGAAAATGG TCAAGTAAGT	9180
5	GTTCAATATG ATGACAGTAA AGTTGCTGTA TCTCAAATGA AAGACGCAAT TGAAGATCAA	9240
	GGTTACGATG TCGTTTAATT AGGCAATATT CAACGTCATC AACACCAAAT TAAAAAATCG	9300
10	AACTGATGAG AATCCCAACA ATCCAAATTA TCTCATCAGT TCGATTTTTA ATTTACTCGT	9360
	AACCTAGTAT CTCCAGTCTG CAATACATCT AATGTTGCAT CTAATGCATC GACAATTAGA	9420
	TTTTTAACTG CAGCTTCAGT ATAAAACGCA ATATGTGGTG TTAATATGAC ATCTTCCCTG	9480
15	TCAATCAACG ATTCTAACAA TGGATCGTTC AGTGTTTTGC CCCTTTGATC ACTTGGGAAA	9540
	AGTTTGC GTT CAAATTCATA CGTATCAAGT GCTGCACCTT TAATCACACC ATTGTCTAAT	9600
	GCGTCTAATA ACGCCTTAGT ATCTACTAAA GAACCTCTCG CACAATTGAC AAATACTGCG	9660
20	CCCTTTTTTAA AATGTTTTAA TAATTCAGCA TTAAATAGAT AATGATTATA TTTCGTTGCA	9720
	GGTACATGTA ATGTCACGAT ATCAGCACCT TCAACCGCTT CCTCAATCGT ATCTTTGTAA	9780
	TCGACATACG TTGCAATTTT AGCATTAGGA AACGGTCGTA TGCGACCACA TCACTTTGAT	9840
25	AACCATTGGC AAATATATCG GCTACTACAC GGCCAATTCG ACCTGTACCA ATAACAGCTA	9900
	CTTTTAAATC TTTAATGGAT TTCGATAAAA TAGTAGGTTC CCATCTAAAA TCATGCTCCC	9960
30	GCACTTTCGT TTGAATTTGA TTAAATGAC GAACCACATT AATAGCCTGG TTCACAGCAA	10020
	ACTCCGCAAT TGAATTCGGA GAGTATGACG GCACATTTGA CACAATAAAG TTATACTTGT	10080
	TTGCTAACTC CAAATCATAT GTATCAAATC CAGCACTACG TTGTGCGATT TGTTTAATAC	10140
35	CTAGTTCATT TAATCGTTTA TAAACATGCT CTGATAATGG TATTTGTTGT GATAGCGATA	10200
	AGCCATCATA ACCAGCGACA CCTTCAACAT TGTCATCAGT TAATGCTTCT TTAGTAATAT	10260
	CTACCTCAAC ATGATGTTTC TCTGCCCACG CCTTGATATA AGGCATATCT TCATCACGTA	10320
40	CACTCATGAT TTTAATTTTT GTCATTTTAA CATCACCTT AACTTTATTA TTCATATAAA	10380
	TATGCTAGTT CTGTTAATCT TATTGCAGCT TCGTCTAATT TCTGGTCATC TAACGCCAAT	10440
	GAAATTCTCA CATAACGATT ACCATTCTCT CCAAATGGTT TCCCTGGAGC AACAAGTATT	10500
45	GACTTCTCTT GCACTAAAAA TTGCTCAAAT TGCTCGCTGT CATAACCAGG CGGTGTTTCC	10560
	AACCATACAT ATATGCCACC TTTAGCATGA ACAAATGGCA AATCAGCTTT TGCAAGCATG	10620
50	GCTTCGAATC GGTCACGACG TGTTTTAAAT ACATTGCTTT GTTCTTCTAA AAAATCATCA	10680
	TAATGATTCA AAGCATATAT TGCGGCATCT TGTAATGCAC CAAACATCCC AGCATTTGTG	10740
	TGCGTTTGGT ACTTTTTCAA AGCTTGAATC ATATCTTTAT TACCAACTGC AAAACCGACT	10800

55

	CCATTTTCCG AAGCAAGTAT ACTAGGATTT TTAGCGTCGA AACCAGAAAGC ACCATAAGCA	10920
	AAATCATGCA CGATTTTAGT GTCTGTACCT TTAAATTTAG CTATCGCTTC ATCAAAAAC	10980
5	TCTTTCGTAG CTGTCGATCC AGTTGGATTA TTTGGATACG TTAAATAAAT GAGTTTGT	11040
	TTATCTATTA TTTGTGAATC AACTTTGGAC CAATCTGGCA AATAATGTGG CGGTTCTAAA	11100
10	TTAAGCGGGA CTGGCTTGCC ATCAGCTAAA AGTACACCTG CTAAATAATC CGTGTAGCCT	11160
	GGATCAGGTA GTAATACATA GTCTCCTGGA TTGATAACAC ATGTTGGTAC TGCCACTAAT	11220
	CCATTTTTTG TACCATATAA AATGCATACT TCATCTTCTT TATCTAACGT CACATTATAT	11280
15	TGTCTTTGAT AAAAATCTAC AATAGCTTGC TTGAACGCTT CTTTACCATG AAAAGCACCA	11340
	TATTTTTGAT TTTCAGGAAT AGTTAGTGCT TTTTGAAAAT GATCAATAAT ACCTTGTGGC	11400
	GTGGGCCCCAT CAGGGATTCC AACTGCCATA TTAATTAATG GCAATGGTCC ATGTTGATT	11460
20	TTACGTCCCA TCGTTTTCCC GAAATAACTA TCAGGGATAT TTGCTAATTT GTTAGAGATC	11520
	ATCAAATTCC TCCTCTATCA TTAAACATAG CCTGGGCGAC TATCATAATC CTAACAACTT	11580
	GTATCACTCT CATTTAGATG GTTACAATGA CATCGCCATT CACCGTTATG TTCAACAGAA	11640
25	CTTATGACAC ACGTTGTATT GAATGAATTT ATTTTCATTT TAGGTAGGTA TAATATTATT	11700
	GTCAATATTA GGAATTTTCA GATTAATATG CACTCAATCG TTATGATTTA ACTGTCATGC	11760
30	ATATCCGCAT GCGCAACCAG TTAGATATGC TTATATAAAG TATAACGCCC ATCAAGGTAC	11820
	GTATTCAAAC GTGAACCTTA ACAGGCGTCA TTCATTGTTA AATAAACTT CTTAAGCACA	11880
	TACTTATTTT ACTATGCCTT TTACGTTCCC CTTATACTTT TCTCACATCT TTCTCTTAGA	11940
35	CTACTCCCTT ATACGCCCCG CTCAATATCT TTAATCATTT CATCTACAGT TATTTTCGCA	12000
	CTCGTTAAGA CAATAGGAAC GCCTGCACCT GGATGCGTAC TTGCACCTGC AAAATATAAA	12060
	TCTTTATAAT CTCGCGATAC ATTTTGTGGA CGATAATAAT TACTTTGCGC TAAAGTTGGC	12120
40	ATTAAACCGA ATGCCGAACC AAATTTGCGA TGATACGTTT GCTCAAATC ATTTGGCGTA	12180
	AAGATTGTTT CTGAAACAAT ATGCGATTTT ATATCTTCAA ATACTTCAAT CGTTGCTAAT	12240
45	TTACGATAAA TAATTTCTT TATTTGTGTC GTCAAAGCTT CATCTGACCA ATCGATTCCG	12300
	CTACCTGTTT TAAGTTCCGG CGTCGGCATT AGCACATAAA TACCAGTTTT GCCTTCTGGC	12360
	GCAAGTGATT TATCAGCGAC CGCTGGTACA TACACATAAA TAGAAGGATC ATATGATAAA	12420
50	CGTCCCTCAA ATATTTCTTC AATATTGCCT CTAAAGTCAT CTGAAAAAAT AACATTATGA	12480
	AGTCTCACTT GATCTGTAC ATCAATATCT ATACCGATAT ACATTAAAAA TGCTGAACAA	12540
55	GAGTAATCTA AGTCTGCAAT TTTATGTGGT GGATACTTTT TAATAGGTGC AAAATCTGGC	12600

5 ATGTCACCAT TCACTTTTAT CGCATCGGCC CGTTTGAATT TAGGATCAAT AATAATTTGC 12720
 TCAATTTTCAG CATTTAGTTC AATATTAACG CCTAAGTCTT TATTTAATTG CGCTAGCCCT 12780
 10 TGAGCCATGC CATACATACC GCCTTTAATA AAATGCACAC CAAACATCAT TTCAATCATA 12840
 GGAATAATTG AATATAGTGA CGGGCCTCGT TTTGGATCAA TTCCTATGTA TAACGTTTGA 12900
 AACGCTAAAA GCTTTTGTAT CTTTTCGTTA TCAATATAAT GTTCAATTAG CTGATCTGCA 12960
 15 TGATTTAACG TTTTAACTT AGCACCTTGC ACAAGTGACG TCATATTATA AAAGTCACTC 13020
 GGTTCGCGAT ACGTTCCTTC TAAGAAATAG CGACGTGCAA TTTCATATTT TTTATAAACA 13080
 TCCGTTAAAA AGGACATAAA ACCATGCGTT GAACCAGGT CTATACTTTC TAGCATTTGC 13140
 TGTAATTCAG CTAAATCTGT AGGCACCGTT ATACGATCAT CGTGGTCAA ATACACATCG 13200
 TAAATATAAC GTAATTGTCT CAATTCAATA TAATCTTCAT AATTTTTACC ACACGCTGTA 13260
 20 AAAACATCTT TATAAACATC TGGCATCATG ACAATTGTGG GACCCATATC AAATGTAAAG 13320
 CCGTCTTTCT TTAATTGATT CATACGCCCC CCTACATTAT TATTTTTTTC AAATATCGTC 13380
 ACTTCATGAC CTTGAGAAGC AATACGGGCT GCCGCTGCTA ATCCTGTGAC ACCTGCACCA 13440
 25 ATTACTGCAA TCTTCATTAT TCAACCACCT ATATTCTATG ATATTTACTA TTTATTTTCAT 13500
 GAAACAACTT TGCCTTTTTT CTCTTATCCA CAAAAACAG TTCATGTAAT GTATAGTTAG 13560
 CCTGTCTCAC TTCGTCCAGT ATTTCAATAT ATATACGTGC TGCTAATTCT ATGATTGGTT 13620
 30 GTGCTTCAAT ACTAAATACT TTGATTTGAT CCATAACATC TTGAAAATCT TTTTCTGCGA 13680
 TAGCTGCATA ATATCCCAT AAGTCAATAT AATGATTATT AACACCATTT TGGTACACTT 13740
 35 CAGCAATATC AACTTCATAT TGCTTTAATC GTTGCTTACT AAAATATATC CGTTCATTGT 13800
 CAAAATCTTC ACCGACATCT CTTAATATAT TAAGGGGATC CTCTAGAGTC GACCTG 13856

(2) INFORMATION FOR SEQ ID NO: 32:

- 40 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 10088 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 45 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 32:

50 ATATATAAAT ATAGATTAAG TATATAGATT AATCAACTTT TTTGGAAGAG CAAATCACGC 60
 AATCAACAAA TAATATAAGA AGTTTTTGCG ATAGTTTAA AATAGCTGTA ATAGAATACT 120
 AAATGTGACA AACTTAGAAC TAATATCAAG TGTTGATGTT TTGAATATAA AAATGCTAAT 180

55

EP 0 786 519 A2

	ATAATTGGTT AATATATGAG TAATTAGAAA ATAGACAAAG GATGACGATT TATGTATATC	300
	AATATGAAAG ATTATGGGTT AACAGGCATA AACAAAATA AAGATACTCG AGCAATACAA	360
5	CGTGCCTTAA ATCGTGGAAG ATGTAAACCA ACGACAGTTT ATATACCGAA AGGGACGTAT	420
	GATATTTGCA AACCATTAAAC GATATATGGC AATACAACAC TTTTGTTAGA TAATGAAACT	480
10	ATTTTACGCC GATGTCATTG TGGTCCTTTA TTAATAAATG GTCGTCGCTT TGGTTTTTaT	540
	CGTGGTTATA ATGGACACAG TCATATTCAT ATTAAAGGCG GCAAGTTTGA TATGAATGGT	600
	GTATCGTATC CTTATAACAA TACAGCTATG TGCATTGGGC ATGCTGAAGA TATTCAATTA	660
15	ATAGGTGTGA CCATTAAGAA TGTAGTGAGT GGTCAATGCA TTTGATGCTT TGGGATTAAAC	720
	GGACTCTATA TTAATAAGCTG TTCATTTGAA GGATTCATAG ACTATAGTGG CGAACCtTTT	780
	ATTCTGAAGC AATACAATTA GACATTCAAG TACCTGGTGC TTTTCCAAAA TTCGGAACgA	840
20	CAGATGGTAC GATAACGAAA AATGTCATTA TCGAAGATTG TTATTTTGGG CCTTCAGAAT	900
	TGCCCCGAAAT GGGAAAGTTGG AATCGTGCTA TTGGCTCACA TGCAAGTAGA CATAATCGAT	960
	ACTATGAGAA TATTCATATT AGAAATAATA TATTTGAAGA TATACAAGGT TATGCATTAA	1020
25	CTCCCTTGaA GTATAAAGAT GCTTTCATTA TTAATAATAA GTTTATTAAAC TGTGaGGGTG	1080
	GCATTAGATA TTTAGGAGTT AGAGATGGTA AAAATGCAGC AGATGTGaTG ACAGGaAAAG	1140
30	ACTTAGGTTT CCAAGCAGGC ATAAATATGA ATATAATTGG AAATGAATTT AAAGGATCAA	1200
	TGTCTAAAGA TCGGATACAT GTACGTAATT ATAATAATGT TAAACATAAA GATGTATTAA	1260
	TCGTTGGGAA TACATTCAAT AATTCGACTC AATCAATTCA TTTAGAAGAT ATTGATACAG	1320
35	TGTTTTTAAG TCCTGTTGAA GCGGGTATTC AAGTTACTAC AATCAATGTA GATGAAATAA	1380
	AAAAGTAAAA AGTTTCGCAT GACATTAGGA TTAAGAATAG TAGATAATTT TTGAAAGCGC	1440
	ATTEATAAAA CGGTATAAAT ATGCTATAAT AAACCCAATT ATCTGATAAA AGGGGTATTT	1500
40	TGACGGTAAT GATAATACAA GATAGACAAC TTTCTATACT CTAATATAGT GAGTTGAAGT	1560
	AGCTTGTCAT AATCATCATG AGGGGGAAAT TTATGGCTTA TTTCAATCAA CATCAATCAA	1620
	TGATATCGAA AAGGTATTTA ACATTCCTTT CAAAATCAAA GAAAAAGAAA CCGTTTAGTG	1680
45	CGGGACAAC TATTGGACTA ATATTAGGTC CATTACTTTT CCTATTAACA TTATTATTCT	1740
	TTCATCCACA AGACTTACCT TGGAAAGGCG TCTATGTTTT AGCGATTACT TTATGGATTG	1800
50	CGACTTGGTG GATTACTGAA GCAATTCCTA TTGCAGCAAC GAGCTTATTA CCAATTGTGT	1860
	TATTACCATT AGGTCATATA CTTACACCAG AACAAGTATC ATCCGAATAT GGCAATGATA	1920
55	TTATCITTTT GTTTTTAGGT GGATTTATTT TGGCAATTGC AATGGAAAGA TGGAATTTAC	1980

	TTGGATTTCAT GGTGGCAACA GGATTCTTAT CTATGTTTGT ATCGAACACT GCAGCTGTAA	2100
	TGATTATGAT TCCGATTGGT TTAGCAATTA TTAAGGAAGC ACATGATTTA CAAGAAGCCA	2160
5	ATACGAATCA AACAAGTATT CAAAAGTTTG AAAAATCTCT AGTTTTAGCA ATTGGCTATG	2220
	CAGGTACGAT TGGTGGCTTG GGTACATTAA TCGGAACCCC GCCATTAAAT ATTTTAAAAG	2280
	GACAATACAT GCAACATTTT GGACATGAAA TTAGTTTTGC TAAATGGATG ATTGTAGGGA	2340
10	TTCCAACGGT CATTGTTTTG TTAGGTATTA CTTGGCTCTA TTTAAGATAT GTTGC GTTTA	2400
	GACATGATTT GAAATATTTa CCTGGTGGTC AGACGTTAAT TAAACAAAAG TTAGACGAGC	2460
15	TTGGCAAAT GAAGTATGAA GAAAAGGTAG TACAACTAT CTTGTACTT GCTAGCTTAT	2520
	TATGGATTAC AAGAGAGTTT CTTCTGAAAA AATGGGAAGT TACGTCATCT GTTGCAGATG	2580
	GTACGATTGC TATTTTTATA TCAATATTAT TATTTATTAT TCCAGCTAAA AATACTGAAA	2640
20	AACATCGCCG TATCATTGAC TGGGAAGTTG CAAAAGAGCT CCCTTGGGGT GTATTAAATTT	2700
	TATTTGGTGG CGGTTTAGCA TTAGCGAAAG GTATTTCTGA AAGTGGTTTA GCAAATGGT	2760
	TAGGCGAACA GTTGAAATCA TTAAATGGTG TTAGTCCGAT TCTTATTGTA ATTGTCATAA	2820
25	CAATCTTTGT CTTATTTTAA ACTGAAGTGA CATCTAATAC TGCAACTGCA ACGATGATTT	2880
	TACCGATTTT AGCAACGTTG TCTGTTGCTG TTGGAGTGCA TCCATTACTA CTTATGGCAC	2940
30	CTGCAGCTAT GCGCGCTAAC TGTGCATACA TGTTACCAGT AGGGACACCA CCGAATGCAA	3000
	TTATCTTTGG TTCTGGTAAA ATATCTATCA AACAAATGGC ATCAGTAGGA TTCTGGGTAA	3060
	ACTTAATCAG TGCAATAATT ATTATTTTAG TCGTGTATTA TGTAATGCCT ATAGTTTTAG	3120
35	GTATTGATAT AAATCAACCA CTGCCATTGA AATAGTAATT GCAGATTAGA ACGAAAAATA	3180
	AAAGGTTACA TTAGCAATTG CTTGGACGAG TGGTAACGAA ACGTATACCG CAGCATCGTG	3240
	TAAaACAAT ACAACAAAA GAAAGTCAAC CAAGGATGGA TTCCTATTTT AATCCTTGGT	3300
40	TGACTCTTTA TTTTATTTAA ATTGTAGAAC CTAGAAAATA AAGTTTAATT AAAAGCACCA	3360
	ATCATTTCTA CTTTGAAATC TAAGGTTTCT AAAATAGCAA TGACTTTCTT TATATCGGTT	3420
	GTAATTGCAG AATCAGCCTG AACGAAAAAT CGATACATAC CTAATTGTGT TTTTAAAGGA	3480
45	CGAGACTCAA TCCAGGATAA ATTAATATTA AACAAAGCAA ATGTATTAAG CACACTTGCT	3540
	AACAACCCAG GTTTATCATG CATTGGTGTA ATTAAAAACA TCAATGATGT CGCATTTTGA	3600
50	TCAAATTGCT GCTGATTTTT TATACTAAA AAACGTGTCA CGTTATGTGG ATAGTCTTCA	3660
	ATATGTGTAT CAATAGGTGT AAAACCATAA GctTCGCCAC TACCTAAAGG TGCAATTGCT	3720
55	GCAACGCCAT TTTCAATTTT AGTCAAACCT TGAATTGTAC TGTCGACATA ATCATAGTCA	3780

	TTTTTAATAT CAGAAATGGA ATCTGTTCCA TTACCATATA ATGCAAAGTT AATATCTAAA	3900
	CGTATTTTAC CGTGTGCCAA GACATCTTGC TGTGCAAGTG CATCTGCCAC AATGTTGATT	3960
5	GTTCCCTTCTA TAGAATTTTC AATAGGGACA ACACCAATCG ATGTGTCATC ATCTGCAACT	4020
	GCCTTGATGA CTTCAAATAA ATTTGACTTT GGTGAAAAG TTGCTTCATT TTCAGAAAAA	4080
10	TACTGACGAC AAGCCAAATA TGAAAATGTA CCTTTAGGGC CTAAATAATA TAATTGCATA	4140
	TGCTACACCT CTAATAACTT AATGATGGAA AGGGCACTGG TTAGCATTTG ATTCTTTCTT	4200
	TTTATAGAAA AAGTTTGGAT CTTTACTGT ATTGTCATAT CCGTGATGAT AATTTGACGT	4260
15	CAATGTTGGA GATAATGGCG GTGCTAGCCA AGACCATTTT CCGGTAACCTT GACGACCTTG	4320
	TTGTGCTTCG TTACGTTCGA ATAGTTCGAA TTGCTTTGCA GCGGTCAAAT GATCGACAAT	4380
	TGATACGCCT TCTTTTAA AGGAATGATA CACAGCATAG TTCAATTCAA CAAGTGCTCG	4440
20	ATCTTTATTA AATGAATTAT TTTTAAGTGT ATCAAATTCA AACGCATCTG CAACTTTTTC	4500
	TAGTAAATTG TAACGGTAAT CATCAATAAA GTTACGTACG CCAATTTTCAG TTACCATATA	4560
	CCAACCGTTA AAGGGTGCAG TTGGATATAC AATGCCACCG ATTTTAAAGT CCATATTGGA	4620
25	AATGATAGGG ACTGCATACC ATTTAAGTT CAATTTTCTT AATTTTGGAT AATGATTATG	4680
	TTCAATAGGT ACTTCTTTAA TTAATGAAGT AGGATATTCG TAAAATTTAA CTGACTCATT	4740
30	AGGTAATTGG TAAATCAGTG GTAACACGTC AAAATTAGTA CCTTTTCCTT TCCAACCTAA	4800
	GTGATTGCT AAGCGTGTA CTTCTTTTTC AGCAGGATCA CCACAATTGT CATAGCCAGC	4860
	ATAGCGAATT AATTGATTGT TGAAAATTTT AGGTCCATCC TTTGGAGCAT ATATAGTAAT	4920
35	ATACGGCTTT AATTACCTT CATTGTAGC CTGTGTAATA TGATAAGTAA TTGATGATAA	4980
	GAACGATGCT TCGTCAGTAA CATCTCTTGC ATCAATGACA TTTAACGAAT CCCAAAATAA	5040
	ACGACCAATG CAACGATTTG AATTACGCCA AGCCATTTTA GCACCATAAA TAAGTTCTTC	5100
40	TTCTGTATGT GTATATGTCC CAGTTTCTTT TATTTCTAGT TCAATGTCAT GTAAACGTTT	5160
	ATTGATAATT TGCCTTTCAT AATGACACTC TTTATACATG TTTTCTATGA AAGCTTGAGC	5220
	CTCTTTAAAT AACATTAACA ACACCTCGCT TTATATTATA GTCTACATTA TTAAAATACT	5280
45	CTTAAAAATT ATGTATATGT CATTAATTTG TTGGTTGATT TTAATTAAAA GTATGGAAAT	5340
	TAAGGGGCTC TTATGTATAT AAAAAATGA ATTATGATAA AATGTAAGAA AATATTTAGG	5400
50	TCGATTGGAG AGATACAAGT GTACCAATTA GAAGACGACA GTTTAATGTT ACATAATGAC	5460
	TTATATCAAA TAAATATGGC TGAAAGTTAT TGGAATGATA ATATTCATGA AAAAATGGCT	5520
	GTATTTGATT TGTATTTTAG AAAAATGCCA TTTAATAGTG GCTATGCTGT TTTAATGGT	5580

55

	TTAAAGTCTA TTGGCTACAA GGATGATTTC TTATCATATT TAAAAGATTT AAAATTCACA	5700
	GGCAGCATCC GTTCGATGCA AGAAGGCGAA TTATGCTTTG GTAACGAACC ATTGTTACGC	5760
5	GTAGAAGCAC CATTGATTCA AGCGCAATTA ATAGAAACAA TTTTATTAAA CATTGTAAAT	5820
	TTCCATACAT TAATTACAAC AAAGGCTAGC AGAATTCGTC AAATTGCATC AAATGATAAA	5880
10	TTAATGGAGT TTGGTACACG TCGTGCGCAA GAAATTGATG CAGCATTGTG GGGCGCTAGA	5940
	GCTGCTTACA TCGGGGGCTT TGATTCTACA AGTAATGTTA GGGCGGGGAA ATTATTTGGT	6000
	ATACCTGTGT CTGGTACACA TGCACATGCA TTTGTCCAAA CTTATGGAGA CGAATATGTT	6060
15	GCCTTCAAAA AATATGCTGA AAGACATAAA AATTGTGTGT TCCTAGTAGA TACATTCCAT	6120
	ACTTTAAAAAT CTGGCGTGCC AAATGCAATA AAAGTTGCAA AAGAATTAGG TGACAAAATT	6180
	AACTTTGTAG GTATTCGATT AGATTCTGGA GATATCGCTT ATTTATCTAA AGAGGCAAGA	6240
20	CGTATGCTTG ATGAAGCAGG ATTTACTGAA ACTAAAATTA TCGCGTCTAA TGATTTGGAT	6300
	GAAGAAACGA TTACGAGTTT GAAAGCACAA GGTGCAAAAG TAGATTCTTG GGGCGTTGGT	6360
25	ACAAAGCTGA TTACAGGATA CGATCAACCA GCATTAGGTG CAGTATATAA ACTTGTAGCT	6420
	ATTGAAAATG AAGATGGTTC ATATAGTGAT CGTATTAAAT TATCAAATAA CGCTGAAAAG	6480
	GTTACGACGC CAGGTAAGAA AAATGTATAT CGCATTATAA ACAAGAAAAC AGGTAAGGCA	6540
30	GAAGGCGATT ATATTACTTT GGAAAATGAA AATCCATACG ATGAACAACC TTTAAAATTA	6600
	TTCCATCCAG TGCATACTTA TAAAATGAAA TTTATAAAAT CTTTCGAAGC CATTGATTTG	6660
	CATCATAATA TTTATGAAAA TGGTAAATTA GTATATCAAA TGCCAACAGA AGATGAATCA	6720
35	CGTGAATATT TAGCACTAGG ATTACAATCT ATTTGGGATG AAAATAAGCG TTTCTGAAT	6780
	CCACAAGAAT ATCCAGTCGA TTTAAGCAAG GCATGTTGGG ATAATAAACA TAAACGTATT	6840
	TTTGAAGTTG CGGAACACGT TAAGGAGATG GAAGAAGATA ATGAGTAAAT TACAAGACGT	6900
40	TATTGTACAA GAAATGAAAG TGAAAAAGCG TATCGATAGT GCTGAAGAAA TTATGGAATT	6960
	AAAGCAATTT ATAAAAAATT ATGTACAATC ACATTCATTT ATAAAACTTT TAGTGTTAGG	7020
45	TATTTCAGGA GGACAGGATT CTACATTAGT TGGAAACTA GTACAAATGT CTGTTAACGA	7080
	ATTACGTGAA GAAGGCATTG ATTGTACGTT TATTGCAGTT AAATTACCTT ATGGAGTTCA	7140
	AAAAGATGCT GATGAAGTTG AGCAAGCTTT GCGATTCATT GAACCAGATG AAATAGTAAC	7200
50	AGTCAATATT AAGCCTGCAG TTGATCAAAG TGTGCAATCA TAAAAGAAG CCGGTATTGT	7260
	TCTTACAGAT TTCCAAAAAG GAAATGAAAA AGCGCGTGAA CGTATGAAAG TACAATTTTC	7320
55	AATTGCTTCA AACCGACAAG GTATTGTAGT AGGAACAGAT CATTGAGCTG AAAATATAAC	7380

	TAAACGACAA	GGTCGTCAAT	TATTAGCGTA	TCTTGGTGCG	CCAAAGGAAT	TATATGAAAA	7500
	AACGCCAACT	GCTGATTTAG	AAGATGATAA	ACCACAGCTT	CCAGATGAAG	ATGCATTAGG	7560
5	TGTAACCTTAT	GAGGCGATTG	ATAATTATTT	AGAAGGTAAG	CCAGTTACGC	CAGAAGAACA	7620
	AAAAGTAATT	GAAAATCATT	ATATACGAAA	TGCACACAAA	CGTGAACCTG	CATATACAAG	7680
10	ATACACGTGG	CCAAAATCCT	AATTTAATTT	TTTCTTCTAA	CGTGTGACTT	AAATTAAATA	7740
	TGAGTTAGAA	TTAATAACAT	TAAACCACAT	TCAGCTAGAC	TACTTCAGTG	TATAAATTGA	7800
	AAGTGTATGA	ACTAAAGTAA	GTATGTTTCAT	TTGAGAATAA	ATTTTTATTT	ATGACAAATT	7860
15	CGCTATTTTAT	TTATGAGAGT	TTTCGTACTA	TATTATATTA	ATATGCATTC	ATTAAGGTGA	7920
	GGTTGAAGCA	GTTTGGTATT	TAAAGTGTA	TTGAAAGAGA	GTGGGGCGCC	TTATGTCATT	7980
	CGTAACAGAA	AATCCATGGT	TAATGGTACT	AACTATATTT	ATCATTAAACG	TTTGTTATGT	8040
20	AACGTTTTTTA	ACGATGCGAA	CAATTTTAAAC	GTTGAAAGGT	TATCGTTATA	TTGCTGCATC	8100
	AGTTAGTTTTT	TTAGAAGTAT	TAGTTTATAT	CGTTGGTTTTA	GGTTTGGTTA	TGTCTAATTT	8160
	AGACCATATT	CAAAATATTA	TTGCCTACGC	ATTTGGTTTTT	TCAATAGGTA	TCATTGTTGG	8220
25	TATGAAAATA	GAAGAAAAAC	TGGCATTAGG	TTATACAGTT	GTAAATGTAA	CTTCAGCAGA	8280
	ATATGAGTTA	GATTTACCGA	ATGAACCTCG	AAATTTAGGA	TATGGCGTTA	CGCACTATGC	8340
30	TGCGTTTGGT	AGAGATGGTA	GTCGTATGGT	GATGCAAATT	TTAACACCAA	GAAAATATGA	8400
	ACGTAAATTG	ATGGATACGA	TAAAAAATTT	AGATCCGAAA	GCATTTATCA	TTGCGTATGA	8460
	ACCTCGAAAC	ATACATGGTG	GATTCTGGAC	TAAAGGCATT	CGTCGTAGAA	AGCTTAAAGA	8520
35	TTATGAACCA	GAAGAACTGG	AAaGTGTAGT	AGAaCATGAA	aTTCmAAGTA	AaTGAGaATG	8580
	AAmCAATtGC	TGATTGTTTG	TCACGAATGA	AAtGCAAGGG	TATATGCCCG	TAAAACGTAT	8640
	TGAAAAACCC	GTGTTTCAAG	AGCAAAAAGA	TGGCACGGTT	GAAGTATCAC	ATCAAGAAAT	8700
40	CGTTTTTGTA	GGTAAGAAAA	TCCAATAACA	TAATCCAATT	TAAATAAAGA	CTATTTGAAG	8760
	AGGAAAGGCT	ATTCAAAGTT	TGAGTAATTT	TACTTTGAAT	AGCCTATTTG	TTTATACATG	8820
45	CAAGATGCTC	GATCCATATT	GTATGAGAAA	CCCCCAGCAA	GCTATATAAA	GCATATGCTG	8880
	GGGGTTCTTA	ATATTTTAAA	AATTATTGTT	AGATTATATA	TATCGTCGCT	TTTTCTAAAA	8940
	CAATCTCATC	GCATGAAATT	TTTTCTTCCT	AGAGACCTTT	AATAAGATTA	ATAGTTTACT	9000
50	TAATCATATC	TAGATAGTCT	TATGACTTAT	GCTTAATGAA	AGTCATTCTA	GGAGAAGTTC	9060
	CCAAAGCTTC	TGTGTTTATA	ATTGTTAGTA	GTATTTTATT	ATCATTTGGT	ATAAATATTT	9120
55	CAATAACAAT	TGAGCTATTA	TTTTTATTAT	ATAATGTGAG	TTGTTTGTGT	TCTGTATTTA	9180

CATTTAAATC TTGAGGATGC CATTCTCCCT CAATAATATT AAGATAATAC TTAGCCTCTG 9300
 AATTACATTT GAATTTATCA ATACTAAATA ATTCAATTTG TTCCATAATA TTATTTACCT 9360
 5 TTCTAAAATA CAAATTTTAA TAACCATAAA TAGATGAATA CCATCGATAA TGGTCGCCAT 9420
 TGGATACTGG AATAACATTG TTTTGTAGCAT CTTGAGTCAT AAAACCATTA TCCCATGGAT 9480
 TCCATATAAT TATAACCTCT TGTCCATTAT CTAATTTAGC GTTCCCAACA ACTGCCATGG 9540
 10 CATGCCCTGC GTGCATACCA TTTCTTGATT CTACTCTACT ACCTAAAACA GCAATTCCTT 9600
 TATTATTTTT AGTAAGATTG TCAACTTCAT TATATGTAGT CATTCTATTA AGAAGTTGTG 9660
 GACTTCTTCC CTGAGTTTGT CAAAATAAA TCATCTCTCT TGGCGTTAAA CCAGTAAATT 9720
 15 GGAATCGTTG TCCTTGTAAG TTTGGGTGTA AAAATCTCAT CACAGCTTCT GCATGATATT 9780
 TGTTAGTATT ATAAGTCGCA TTTAGTAATT CAGACATCGT ATAGCCTGCA CACCAACCAT 9840
 20 TGTTACCTTG AGTTTCTCTT ATCTTGAAAT TCTCAAGTTT ATTTATATAT TGSTCGTTGT 9900
 AAGTATAATT ATTACTTTTA AATTGACTAG TTGGCATACT GACAGAAGCT TTTTGCTTTA 9960
 GTTGCCTTAC ATTATTGCCA GTAGGTATAC TCTCAGTCTT TnTnAACTnT nTATCTTCTA 10020
 25 GACGTGGTGT TTTTAGTACT AGTTTAGCTT TATGATTTTG AGTACCACAT AGTAACCTTT 10080
 TGAGTTGT 10088

(2) INFORMATION FOR SEQ ID NO: 33:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 7563 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 33:

40 CGGAAACGnA CCCnATGCGT ATGCTTGACG TGCCAAAATT AAATACGAAG TTCATAGCTT 60
 TGAGGTACCA GAAGAACATT TATCTGGTCA AGAAGTCGCA GnACTCATAC AAGCAAATGT 120
 TAAAACAGTA TTTAAAACGC TTGTTCTAGA AAATACAAA CATGAACATT TTGTATTTGT 180
 45 TATCCAGTA AGTGAAACTT TAGATATGAA AAAGGCAGCT GCTTTGGTTG GAGAGAAGAA 240
 ATTGCAGCTT ATGCCTTTAG ATAATTTGAA AAATGTAACG GGATACATTC GTGGTGGGTG 300
 TTCGCCTGTT GGTATGAAAA CATTGTTTCC AACAGTCGTT GACAAATCGT GTGAAAATTA 360
 50 TAGTCATATC AGTGTGAGTG GTGGGCTTCG AACAAATGCA ATCACAATAG CTGTTGAGGA 420
 TTTGATTACA ATAATAAAG GCAAAATTGG AGCAGTTATC CATGAATGAT TAATAACAAC 480

EP 0 786 519 A2

	TGCCCACTC CTTTTTGATT GAATTAGCAT TTTACGATCA TAAACAGTCA TTATAATTGA	600
	GATTTTGAAC ATAAAAATGT AATTTTATCG TAACAATTTG AGTGTGTTGTG ATTGTTTTTG	660
5	GTAATTTATG ATTGAAAAGT GAAAGCGTAC TCATTATAAT ACAAAGTGAG ATGGGGTGAT	720
	GATGATAATT ACTGaAAAAA GACACGAGTT AATATTAGAA GAACTTTTCGC ACAAAGATTT	780
10	TTTGACTTTA CAAGAATTAA TAGATCGAAC TGGTTGCACT GCTTCAACAA TACGAAGAGA	840
	TTTATCTAAA CTACAACAAT TAGGGAAATT GCAACGTGTG CATGGTGGTG CAATGTTAAA	900
	AGAAAATCGT ATGGTTGAGG CGAATTTAAC TGAAAAATTA GCAACGAATC TTGATGAAAA	960
15	GAAAATGATT GCTAAAATAG CAGCTAATCA AATCAACGAT AATGAATGCT TATTTATCGA	1020
	TGCTGGTTCA TCTACATTGG AGCTAATTAA ATATATTCAA GCGAAAGATA TCATTGTGGT	1080
	AACCAATGGT TTAACACATG TAGAAGCTTT ACTTAAAAAA GGTATTAAAA CAATTATGCT	1140
20	AGGTGGTCAA GTTAAAGAAA ATACACTTGC TACGATTGGT TCTAGTGCTA TGGAGATATT	1200
	AAGACGATAT TGTTTCGATA AAGCTTTTAT CGGGATGAAT GGATTAGATA TTGAACTTGG	1260
	ATTAACACT CCCGATGAGC AAGAGGCATT AGTTAAACAA ACAGCAATGT CATTAGCCAA	1320
25	TCAATCATT GTACTTATAG ATCATTCTAA GTTTAATAAA GTATATTTTG CTCGTGTACC	1380
	TTTGCTAGAA AGTACGACAA TCATCACATC TGAAAAAGCA TTAAATCAAG AATCGTTAAA	1440
	AGAATACCAA CAAAAGTATC ACTTTATAGG AGGGACTTTA TGATTTATAC AGTGACTTTC	1500
30	AATCCTTCAA TTGACTATGT CATTTTACG AATGATTTTA AAATTGATGG TTTGAACAGA	1560
	GCAACAGCAA CATATAAATT CGCTGGGGGG AAAGGTATTA ATGTCTCGCG CGTCTTAAAG	1620
35	ACATTGGATG TTGAGTCAAC TGCCTTGGA TTTGCAGGTG GATTTCTGG GAAATTCATT	1680
	ATAGATACAT TAAATAACAG TGCAATTCAA TCGAATTTTA TTGAAGTTGA TGAAGATACA	1740
	CGTATTAATG TGAAATTAAA AACAGGACAA GAAACAGAAA TCAATGCACC GGTCTCTCAT	1800
40	ATAACGTCAA CACAATTGA ACAACTGTTA CAACAAATTA AAAATACAAC AAGCGAAGAT	1860
	ATAGTTATTG TTGCTGGAAG TGTACCAAGT AGTATTCCAA GCGATGCGTA TGCGCAAATT	1920
	GCACAAATTA CAGCACAGAC AGGTGCTAAA TTAGTAGTCG ACGCTGAAAA AGAATTGGCT	1980
45	GAAAgCGTTT TACCATATCA TCCACTATTT ATTAAACCTA ATAAAGATGA ATTAGAAGTG	2040
	ATGTTTTAATA CAACAGTGAA CTCAGACACA GATGTTATTA AATATGGTCG TTTGTTAGTT	2100
50	GATAAAGGTG CGCAATCTGT TATTGTCTCG CTTGGCGGTG ATGGTGCTAT TTATATTGAT	2160
	AAAGAAATCA GTATTAAAGC AGTTAATCCA CAAGGGAAAG TGGTTAATAC AGTTGGCTCT	2220
	GGTGATAGTA CAGTTGCAGG CATGGTGGCT GGAATTGCTT CAGGTTTAAAC GATTGAAAAA	2280

55

	CGGGACGCTA TAGAAAAAAT AAAATCACAA GTTACGATTA GCGTACTTGA TGGGGAGTGA	2400
	AAATAATGAG AGTAACAGAG TTATTAACAA AAGATACAAT AGCAATGGAT TTAATGGCAA	2460
5	ATGACAAAAA TGGTGTATT GATGAGTTAG TAAATCAATT AGACAAAGCA GGTAAATTAA	2520
	GTGATGTCGC GTCATTTAAG GAAGCGATT CACAATCGAGA ATCACAAAGT ACAACTGGTA	2580
	TCGGCGAAGG TATTGCCATT CCACATGCCA AAGTGGCCGC AGTTAAGTCA CCAGCTATTG	2640
10	CGTTTGGTAA ATCTAAAGCA GGCCTAGATT ATCAAAGTTT GGATATGCAA CCAGCACACT	2700
	TATTCTTTAT GATTGcAGcG CCAGAAGGTG GCGCCCAAAC ACATCTAGAT GCTTTAGCTA	2760
15	AGTTGTCTGG TATTTTAATG GATGAAAATG TACGTGAGAA ATTATTACAT GCTTCATCAC	2820
	CTGAAGAAGT ACTAGCGATC ATAGATGAGG CTGATGATGA AGTGACAAAA GAAGAAGAGG	2880
	CAGAAGCTGA AGCACAACAA GTTGCAACTG CAGAACAATC ATCTAAACAA TCTAATGAGC	2940
20	CATATGTGTT AGCAGTAACT GCTTGTCCAA CAGGTATTGC ACACACATAT ATGGCACGTG	3000
	ATGCATTGAA AAAGCAAGCG GATAAAATGG GTATTAAAAT TAAAGTAGAA ACGAATGGTT	3060
	CAAGCGGCAT TAAAAACCAT TTAAGTGAAC AAGATATTGA AAATGCAACA GGTATCATTG	3120
25	TTGCTGCTGA TGTTTCATGTT GAGACGGATC GCTTCGATGG TAAAAATGTC GTAGAAGTAC	3180
	CAGTAGCAGA TGGTATTAAA CGCCCAGAAG AATTAATTAA TAAAGCATTG GATACAAGTC	3240
	GTAAACCTTT TGTTGCCCCG GATGGTCAAA GAAAAGGTAA CTCAAATGAC AGTCAAGAAA	3300
30	AATTAAGCCC AGGTAAAGCA TTCTATAAAC ACTTAATGAA CGGTGTTTCT AACATGTTGC	3360
	CACTTGTAAT ATCTGGTGGT ATTTAATGG CAATTGTATT TTTATTTGGA GCAAATTCAT	3420
35	TTAATCCAAA AAGCTCAGAG TACAATGCGT TTGCAGAGCA GCTTTGGAAC ATTGGTAGTA	3480
	AAAGTGCATT CGCGTTAATC ATTCGAATTT TATCTGGATT CATTGCACGT AGTATTGCGG	3540
	ATAAACCTGG TTTCGCTTCA GGTCTTGTAG GTGGTATGTT AGCAATTTCA GGTGGTTTCA	3600
40	GATTTATTGG TGGTATTATT GCAGGTTTCT TAGCAGGTTA CTTAACACAA GGTGTTAAAG	3660
	CCATGACACG TAAGTTACCA CAAGCATTAG AGGGATTAAA GCCAACATTA ATTTATCCAC	3720
	TATTAACAGT GACGGCTACA GGCTTATTGA TGATTTATGC CTTAATCCA CCAGCATCTT	3780
45	GGTTAAATCA TTTGTTATTA GATGGATTAA ACAATTTATC AGGTTCTAAT ATTGTATTAT	3840
	TAGGTTTAGT TATTGGCGCT ATGATGGCGA TTGATATGGG CGGTCCATTC AACAAAGCGG	3900
	CATATGTTTT TGCAACAGGT GCGTTGATTG AAGGTAATGC AGCACCATT ACAGCTGCAA	3960
50	TGATTGGTGG TATGATTCCA CCGTTAGCAA TTGCGACAGC GATGTTAATT TTTAGACGTA	4020
	AATTTACAAA AGAACAACGT GGTTCATTA TCCCTAACTA TGTGATGGGT ATGTCATTTA	4080

55

EP 0 786 519 A2

5
 10
 15
 20
 25
 30
 35
 40
 45
 50
 55

TGATTGGTTC AGGTATAGGT GGCGCAATTG CTTTAGGCTT AGGTTACGA ATTACTGCGC 4200
 CACATGGTGG TATTATTGTA ATTGTTGGTA CTGATGGTGC ACACTTACTT CAAACTCTTA 4260
 TTGCACTTCT AGTTGGCACA TTAGTTTCAG CATTAAATTTA CGGTTTAATC AAACCAAAGT 4320
 TAACTGAAAC AGAAATCGAA GCTTCAAAAT CAATGGACGA GTAGTTTTAA TGATGTAAAA 4380
 TGATTGTTAG CAAAGAGCTT CATATTAAGT TGTATGTTCA ATGAATATAT GTTAGTTTTA 4440
 TATATCGTGT TAACGGTAGC TTATACAAAG CTGTAAAAAC ACTTTCTATT AATTCAGTTT 4500
 TTATGAATTG ATATGAAAGT GTTTTTATTT TTAGATAAAT GAATGAAGAA ATAGACACCA 4560
 CAAATGTATA GACTTTTTTA ATATTTTGCA AAAAGTTATG CCAAACGAAG CAGATATAGT 4620
 AAAATATGAG TGTCTTAAAG TGAAAATTTA TAAATAAAGA AGGGTTTATA CGTGTCAGAA 4680
 TTAATTATAT ATAACGGCAA AGTTTATACT GAAGATGGCA AAATCGATAA TGGTTACATT 4740
 CATGTGAAAG ATGGACAGAT TGTGCAATT GGAGAAGTGG ATGATAAAGC AGCAATTGAT 4800
 AATGATACGA CAAATAAAAT TCAAGTGATT GATGCTAAAG GTCATCATGT ATTACCAGGT 4860
 TTTATTGATA TACATATTCA TGGTGGTTAT GGTCAAGATG CAATGGATGG GTCATACGAT 4920
 GGCTTAAAT ATCTATCCGA AAATTTGTTG TCTGAAGGGA CGACATCATA CTTGGCCACT 4980
 ACAATGACGC AATCGACTGA TAAAATAGAT AATGCACTTA CAAATATTGC TAAATATGAA 5040
 GCGGAGCAAG ATGTTCAAA TGCAGCGGAA ATTGTAGGTA TACATTTAGA AGGACCATT 5100
 ATATCTGAAA ATAAAGTTGG TGCTCAACAT CCGCAATACG TTGTACGCCC ATTTATCGAT 5160
 AAAATTAAAC ATTTTCAAGA GACTGCTAAC GGATTAATAA AGATTATGAC GTTTGCACCT 5220
 GAAATTGAAG GTGCAAAAGA AGCGCTTGAA ACGTATAAAG ATGACATTAT TTTTCAATT 5280
 GGTCATACAG TAGCAACATA CGAAGAAGCA GTTGAAGCTG TTGAGCGAGG AGCTAAACAT 5340
 GTCACGCATT TATATAATGC AGCGACGCCA TTCCAACATA GAGAACCAGG TGTTTTGGA 5400
 GCAGCATGGT TGAATGATGC TCTACATACC GAAATGATTG TTGATGGCAC TCATTCTCAT 5460
 CCGGCATCGG TTGCAATTGC TTACCGTATG AAAGGTAATG AACGTTTTTA TTTAATTACC 5520
 GATGCAATGC GTGCAAAAGG TATGCCTGAA GGAGAATATG ATTTGGGTGG ACAAAAAGTA 5580
 ACTGTTCAAT CGCAACAAGC ACGTCTTGCA AATGGTGCGC TTGCTGGTAG TATTTTAAAA 5640
 ATGAATCATG GGTTACGTAA CTTAATATCA TTTACAGGTG ATACATTAGA TCATTATGG 5700
 CGAGTAACAA GTTTAAATCA AGCCATTGCA TTAGGTATCG ATGATAGAAA AGGTAGTATT 5760
 AAAGTAAATA AGGATGCAGA TCTTGTTATT CTAGATGATG ATATGAATGT AAAATCTACA 5820
 ATAAAACAAG GCAAGGTTCA CACATTTAGC TAATAAATAA TCATAATTAA ATGTATGCAA 5880

EP 0 786 519 A2

	TTTTCTGGGG GTGTCTAAAT GGAAGGCGA TAACATGTAG TTGTAATTTA AGTCATAGTG	6000
	ATAAATTTGA ATGCGTGTTA CCCATGAGTG ACACATATAA CATGGAGGTG AATCCCTAGA	6060
5	AATAGGGAAT TAATTGAAA CTTGACCAT AATTAGTTTG ATTATATTTA TTCTATTAAT	6120
	TGCATTAACC ACTGTATTTG TTGGTTCAGA ATTTGCATTA GTAAAAATTA GAGCAACAAG	6180
	AATTGAACAG CTAGCAGATG AAGGAAATAA ACCTGCTAAA ATAGTAAAAA AGATGATTGC	6240
10	TAATCTAGAT TATTATCTTT CTGCTTGTC GTTAGGTATA ACAGTAACAT CTTTAGGGTT	6300
	AGGTTGGCTT GGTGAACCAA CGTTTGAAAA GCTATTACAC CCAATATTTG AAGCAATCAA	6360
15	TTTACCAACT GCATTAACGA CGACGATTC GTTGCAGTG TCATTATATA TCGTTACGTA	6420
	TTTGCATGTA GTACTTGGTG AATTAGCGCC TAAATCTATA GCTATTCAAC ATACTGAAAA	6480
	GCTTGCTTTA GTATATGCAA GACCATTGTT CTATTTCCGT AACATTATGA AACCATTGAT	6540
20	TTGGCTGATG AATGGTTCTG CACGTGTTAT TATTAGAATG TTTGGTGTA ATCCTGATGC	6600
	CCAACTGAT GCAATGTCAG AAGAAGAAAT CAAAATTATT ATTAACAATA GTTATAATGG	6660
	TGGAGAAATC AACCAAACTG AATTGGCATA TATGCAAAAT ATCTTTTCAT TCGATGAAAG	6720
25	ACATGCAAAA GATATAATGG TACCTAGAAC TCAAATGATT AACTAAATG AACCTTTTAA	6780
	TGTAGACGAA TTACTAGAAA CAATAAAGA ACATCAATTT ACGCGTTATC CAATTACTGA	6840
	TGATGGTGAT AAAGACCACA TTAAAGGATT TATTAACGTC AAAGAATTTT TAACTGAATA	6900
30	CGCTTCTGGA AAAACGATTA AAATAGCAAA CTATATaCAT GAGTTGCCAA TGATTTTCTG	6960
	GACAACACGT ATCAGTGATG CATTAATTAG AATGCAACGT GAACATGTAC ATATGAGTCT	7020
35	TATTATAGAT GAATATGGTG GAACGGCAGG TATTTTAAAG ATGGAAGATA TTTTAGAAGA	7080
	AATCGTTGGA GAAATTCGTG ATGAATTTGA TGATGATGAA GTGAATGATA TCGTTAAAAAT	7140
	TGATATAAG ACATTCGAAG TAAATGGCAG AGTACTATTG GATGATTTAA CTGAAGAGTT	7200
40	CGGTATAGAA TTTGATGACT CTGAGGATAT TGATACGATA GGTGGATGGT TACAATCTCG	7260
	TAATACCAAT TTACAAAAAG ATGATTACGT GGATACAACT TATGATCGCT GGGTTGTTTC	7320
	AGAAATCGAT AACCACCAAA TTATTTGGGT GATATTAAAC TATGAATTTA ATGAAGCGAG	7380
45	ACCTACTATC GGACAGTCTG ATGAAGATGA AAAATCAGAA TAGATATTAA TATATAAACC	7440
	AACTAAGAAT GATTTAATTC ATTTTGGTT GGTATTTTTT TTGACTAAAA TTAANGAAAA	7500
50	GTGAAAATAG TATTGGAAC CAATATCTTT AATGATTTAA TGAATAaTT TTATTGAAAG	7560
	CGA	7563

(2) INFORMATION FOR SEQ ID NO: 34:

55

(A) LENGTH: 3492 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 34:

10	TTATATCAAC TTCATGGCGG AACCATTGAT GACCCATTAG ACGAAACAAT AAGCGCATT	60
	SATGAATTGA AACAAGAAGG AATTATACGT GCTTACGGTA TTTCTTCTAT TCGCCCAAAT	120
	GTAATTGATT ATTATTTAAA ACATAGTCAA ATCGAAACGA TAATGTCTCA ATTCAATTTG	180
15	ATTGATAATC GTCCAGAATC ATTATTAGAT GCAATTCACA ACAATGATGT TAAAGTATTG	240
	GCAAGAGGAC CTGTGTCTAA AGGATTATTA ACTTCAAACA GTGTTAATGT GCTCGACAAT	300
	AAATTTAAAG ATGGTATTTT TGATTATTCT CATGATGAAT TGGGTGAAAC AATAGCCTCT	360
20	ATTAAAGAAA TTGAAAGTAA TTTATCTGCA TTGACATTTA GTTATTTAAC ATCACATGAC	420
	GTGCTTGGTT CCATCATTGT AGGTGCAAGT AGCGTCGACC AATTAAAAGA AAATATTGAA	480
25	AACTATCATA CTAAAGTTAG TTTAGATCAG ATTAAACAG CAAGAGCTCG TGTAAAGGAT	540
	TTGGAATATA CCAATCATTT AGTGTAGAAG TCATTTTCAG TAATAAAAAC AGCAGCATGA	600
	GGCGTTTCAT TATAAAAATG CCTTACTGCT GTTGTTTATG TACAATTCGC TATAATTTAT	660
30	GATTATGATT ACTCACTTAT GATAGAAATT AAAGCGTTGT CCTCACGCAT CAGTATTTAG	720
	TAATTTCGCC TTGCGGCATT GCCTTAAGCA AACTTCTGCC ACTTCATCTC TTAATAATTT	780
	TATTAAACA TCTTTCTATA TTTCACTTCG CATGTTGATT CATCATTATT AGTTATTATT	840
35	TGTACACCCA GCACATTTCC TTGCAACACA AGTAGTTTGA ATTTTTCACA AGTATAATAT	900
	AATGTACCGT CTGAAATTTG GTCTACAGAA ATATCGCCTA AAATATCCAG CACTGTAAAT	960
	TCTFCAAATA CTGATAGTTG TTCCGCATAT CGTACACAAA GTCTTACCAC ACTCTCCGAT	1020
40	TGACAGTTCA TTGCCATCCC ACCTATTTAT GCTTTATTTT TAAATAATTT AGGGAAACAT	1080
	CGTTCAAAAA ATCTAGGCGC AATTGATAC ATTTTCAACG CATGaTGCAT CCATTTAGGC	1140
	CGATTAATTT CCAATTGTTT TGTTTAAATG CCATAAATGA TATCTTCTGC AAGCTGATTA	1200
45	GCATCAAGCA TAATTTCCCC CATCTTTTGA gCATACTTCA TTGATGGGTC GGCTTTTTGA	1260
	TGAAAAGGTG TATCAATCGG GCCAACATTA ACTGTCATGA TATGTAAGTT TGGTGA CTCT	1320
50	AGTCTTAAAG CATTCATTAA TGCATAAAAC CCTGCTTTTC ATGCCCCATA ATGTGCAGCA	1380
	TTTGCTTG TG TGGAAAATGC AGCTTGACTT GAAATACCTA CAATATGTGC GTTAGATGTT	1440
	AAATATGGTC TCAACACAGT ATATAAAACA TTA AAACTAA TTAAATTAAG CTGATACGTT	1500

55

	TAAATGAATC CATCGAATGA TGTATTGTCT TCAAATTGCA GTGCCTGTAT CGACTTCAAA	1620
	TCATTTAAGT CACAAGGAAT AACATTTATA GTTTTCCCCA ATTCCTGTTC AAAGATTCTA	1680
5	GTTGCTTTAT CAACATCACG CACCAACAAC GTTACATGCA CTTTATTTTC TAGTAACTTT	1740
	CGGACAATCG ATAAACCTAA ACCACTCGTA CCACCAGTCA CTATAAAATG TTGTCCTTTC	1800
10	ATCAATTAAC CTTCTTTTC AATTATATAG AATGCAATTT ATCAACTTTA CATAATTGAG	1860
	ACAAGTTGAT TATCTTTCTT AATATATATA CAATAATAAG AAAATATAAC ATACAAATCA	1920
	AAACTAAAG GGATGTGaCG TTAATGrAAC TCGTATTTTA TGGAGCTGGT AATATGGCAC	1980
15	AAGCTATATT TACAGGrATT ATTAACtMa GCAACTTAGA TGCCAATGAT ATATATTTAA	2040
	CAAATAAATC TAATGAACAA GCTTTAAAAG CATTGCTGA AAAACTAGGT GTTAACTATA	2100
	GTTATGAtGA TGCGACATTA TTAAAAGATG CAGAyTATGT ATTTTtagGT ACCAAACCAC	2160
20	ATGACTTTGA TGCTCTAGCA ACACGCATCA AACCACATAT TACAAAAGwC AATTGCTTCA	2220
	TTTCAATTAT GGCAGGTATT CCGATTGATT ATATTAAACA ACAATTAGAA TGCCAAAATC	2280
	CaGTTGCTAG AATTATGCCA AACACAAATG CGCAAGTTGG ACACTCTGTT ACTGGCATTa	2340
25	GTTTTTCAAA CAACTTTGAC CCTAAATCTA AAGATGAAAT TAACGATTTA GTTAAAGCAT	2400
	TTGTTTCTGT AATTGAAGTA TCAGAAGATC ATTTACATCA AGTAACAGCT ATCACCgGAA	2460
30	GCGGCCCAGC ATTTTTATAT CATGTATTcG AGCAATATGT TAAAGCTGGT aCsAAACtTG	2520
	GTCTAGAAAA AGAACAAGTT GAAGAATCTA TACGCAACCT TATTATAGGT ACAAGTAAGA	2580
	TGATTGAACG TTCAGAtTTG AGCATGGCTC AATTAAGAAA AAATATTACC TCTAAAGGTG	2640
35	GTACGACACA AGCTGGCCTT GATACATTGT CACAATATGA TTTAGTATCT ATTTTCGAAG	2700
	ATTGTCTAAA CGCTGCCGTC GACCGTAGTA TTGAACtTTC TAATATAGAA GACCAATAAA	2760
	AAcAgACCCG CCAACACATG TATGCATCAT CGCAAGCACT GTGTTTGACG GGTTATTTTT	2820
40	ATAATTTATT GTTATTTGGC AAGCATTGTT TATTACTTTG TCATTAGATT TTAAAACTAT	2880
	CAAAATCTTT TACAAAATTA AAATTAGGTG TATCTTCATT TTGTATCAAT GTTTGATAAA	2940
	TTTCATTAT ATCTTCTGTA TTATAGCGAT TGCTCAAATG TGTAATCAAC GTACGTTTAA	3000
45	CATTGGCTTC TTTTATCAAT GCAAATACGT CTTCAATATG GCTATGATGA TAATTGTTGG	3060
	CTAAATGCTT TTCACCATCT ATATAGGTCG CTTCATGTAC CATCACATCA GCATCTCTAG	3120
50	AAATCACACG TTCATTAGAA CATGGTTTTG TATCACCAA AATTGCTACA ACTGGACCCCT	3180
	GTTTGGACTC ACCTCTAAAA TCTTTTGATT GATAAACTTG ACCATTATGT TCAAATGTAT	3240
	CATGAGATTT TACTTCTTGA TATTAGGAC CTGGTTCAAG ACCAATGTTT TTTAACGCTT	3300

55

CATGATTAAG TAAATGCGCC TCTACAGTAA AACCATCCAT GATGATATGT CAGATGATCA 3420
 TCGATTTCAA TATATGTAAT TGGATAGTTT AAATGTGACT CTGATAAATT CATAGACATT 3480
 5 TCCACATATG CT 3492

(2) INFORMATION FOR SEQ ID NO: 35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1973 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 35:

ATCTAGCGGT ACAAGCGTCT TGGAGGCTAG TATGTTGAAC ATTGTAAACC CTGAAGATCA 60
 20 CTTCGTTGTC ATTGTTTCAG GTGCCTTTGG TAACCGATTT AAACAAATTG CACAACTTA 120
 TTACAAAAAT GTGCATATTT ATGACGTAAC ATGGGGAGAA GCTGTAGATG TCAAAGATTT 180
 CATCAATTC CTTTCAACTT TAAATGTTGA AGTTAAAGCA GTATTTAGTC AATATTGCCA 240
 25 AACATCTACG ACAGTGCTAC ACCCTATTCA CGAGTTAGGA AATGCCATTA ATCAATTTAA 300
 TAGTAATATT TATTTTGTAG TTGACGGCGT AAGTtGCATT GGTGCTGTTG ATGTTGACAT 360
 TAACAAAGAT AAAATTGATG TACTTGTTTC TGGTAGTCAA AAAGCAATTA TGTTACCTCC 420
 30 AGGATTAGCT TTTGTAGCTT ATAGCCACCG TGCAAAAGAA CATTTCAAAG AAGTAACTAC 480
 GCCAAAATTT TATCTAGACT TAAATAAATA CATTTTCGTCA CAAGCTGACA ATTCTACACC 540
 GTTCACACCA AATGTGTCTT TATTTAGAGG TGTAATGCA TACGTTGAAA CCGTAAAAGC 600
 35 AGAAGGTTTC AATCACGTAA TAGCAGACA CTATGCAATT AGAAATGCAT TAAGAAGCGC 660
 CTTAAAGCA TTAGATTTAA CTTTATTAGT CAATGATAAA GATGCATCTC CAACGGTTAC 720
 40 AGCATTCAAA CCTAATACAA ATGATGAAGT GAAAATAATC mAAGATGAAC TTAAAAATnG 780
 CTTTAAAATA ACAATTGcng GTGGTCAAGG CCATCTTAAA GGTCAAATTT TnAGAATTGG 840
 TCATATGGGG AAAATTAGTC CTTTCGATAT TTTATCGGTA GSTATCTGCTT TAGAAATTAT 900
 45 TTTAACTGAA CACCGTAAAG TTAATATAT CCGTAAAGGT ATATCAAAAT ATATGGAGGT 960
 TATTCATGAA GCAATTTAAT GTACTCGTTG CAGATCCCAT ATCAAAAGAT GGTATCAAAG 1020
 CATTATTAGA TCACGAACAA TTCAATGTAG ATATTCAAAC TGGCTTGTC GAAGAAGCAT 1080
 50 TAATCAAAAT TATACCTTCA TACCATGCTT TAATCGTTG TAGTCAAAC ACGGTTACTG 1140
 AAAATATCAT AAATGCTGCT GATTCTTTAA AAGTAATCGC ACGCGCCGGT GTTGGTGTAG 1200

GTAATACGAT TTCAGCTACT GAACATACAC TGGCAATGTT ATTATCAATG GCACGAAATA 1320
 TTCCGCAAGC ACACCAATCA CTTACAAATA AAGAATGGAA TCGAAATGCA TTTAAAGGTA 1380
 5 CTGAGCTTTA TCATAAAACA TTAGGTGTCA TTGGTGCTGG TAGAATTGGT TTAGGTGTTG 1440
 CTAAACGTGC GCAAAGTTTC GGAATGAAAA TACTAGCTTT TGACCCTTAC TTAACGGATG 1500
 AAAAAGCAAA ATCTTTAAGC ATTACGAAGG CAACAGTTGA TGAGATTGCC CAACATTCTG 1560
 10 ATTCGTTAC ATTACATACA CCACTAACAC CTAAAACAAA AGGCTTAATT AATGCTGTCT 1620
 TTTTGGCCAA AGCAAAACCT AGTTTGCAAA TAATCAATGT GGCACGTGGT GGTATTATTG 1680
 15 ATGAAAAGGC GCTAATAAAA GCATTAGACG AAGGACAAAT TAGTCGGGCA GCTATCGATG 1740
 TGTTTGAACA TGAACCTGCA ACTGACTCGC CTCTTGTGTC ACATGATAAA ATTATTGTTA 1800
 CACCTCATTT GGGTGCTTCA ACAGTCGAAG CTCAAGAAAA AGTGGCAATT TCTGTTTCAA 1860
 20 ATGAAATCAT CGAAATTTTA ATTGATGGTA CTGTAACGCA TGCAGTGAAT GCACCTAAAA 1920
 TGGACTTAAG CAATATAGAT GATACTGTAA AATCATTAT CAATTTAAGC CAA 1973

(2) INFORMATION FOR SEQ ID NO: 36:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 7620 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 36:

35 GGTGTTTCAG ATGTCCTGG TTGATTTTTA ATTGTAGACG GGTATTTTGG GCTTTCGCCA 60
 TATTTATTG CCGGCTTACT GTCAAAGCAT AGGAATACTA TCATAACAAT TGTTAGGCCT 120
 AAATGAACAA AATAAAGAAG TACTAACAAA ATATTAAGAC CCATCGGCAT TAATGTAAAA 180
 40 TCACTGTCAT AATAACTATC GATAATCTGT AATACTATAT AAAATATAAT ACTGAATACT 240
 GTCATAATCA TTGGAATAA CATGTCTTCT GATATATCGT GAAATCTTCG AACGCACAAC 300
 GCTAAATTTG GAATAAACGT TGCCAAACTA TAGACAAAAG TATACACAGA TGTAAAGGATA 360
 45 ATCATCAATA TACTCATAAC TATTAATGTT TCGTTATCCG CCGCTATAGA AATAAAGAAT 420
 AGAAATAGGT TTATTATTAG CACACACACA GCTGGAACCA TAAGTATCAA ATGCCATAGT 480
 GCCATATACC AATATTCAT ACGTCTTGAT CCCCCCTTAA AATTTACATA ATTTTCCAA 540
 50 AATAAACGA ATGATTCAT AAAACCTACT TGAGGTAATT GTTCCATTGT AATCTCCCTT 600
 TCGTTAATCA TATTTATATT TTTAATTATT GTTACCGTTA TAATTACAA GATTCATTAT 660

	GTAAAATGAA AACCCGCTAC AAGTACACAT CTATATGGAG ACTCATTGA AAGTCAACGC	780
	TTCGTAACT ATACTAAAAA TATGTCATAC TGCAATGTTT ACGTTTAAAA GAGTCTCAAT	840
5	CTATGCAAAT AAAATATTCC ATAACAAAGT ATATACTTTA CATTTTTATA ATTCTTAACA	900
	ATACTATTTT ATCAAACATT TACCACAATA AAAATATCTT TTTCATTTTT ATTTAAATTA	960
	ATCATATAAT TGCGAGGAGA ATATTATGGA TTTCGTAAAT AATGATACAA GACAAATTGC	1020
10	TAAAAACTTA TTAGGTGTCA AAGTGATTTA TCAGGATACC ACTCAAACGT ATACAGGCTA	1080
	CATCGTGGAA ACGGAAGCTT ACTTAGGTTT GAATGATCGT GCGGCTCATG GCTATGGCGG	1140
	TAAAAATAACA CCTAAAGTCA CGTCATTATA TAAACGTGGT GGTACAATTT ATGCACATGT	1200
15	CATGCATACG CATTTACTCA TTAATTTTGT AACAAAATCT GAAGGTATAC CTGAAGGCGT	1260
	ACTTATCCGC GCAATTGAAC CAGAAGAAGG TTTATCCGCT ATGTTCCGTA ACAGAGGTAA	1320
20	GAAAGGCTAC GAGGTAACGA ATGGCCCAGG AAAATGGACT AAGGCATTTA ACATTCCACG	1380
	GGCTATCGAT GCGCTACGT TAAATGACTG TAGATTGTCT ATTGATACTA AGAATCGTAA	1440
	ATATCCTAAA GATATTATTG CTAGTCCACG AATCGGTATT CCAAATAAAG GTGATTGGAC	1500
25	ACATAAATCT TTACGTTACA CAGTGAAAGG TAATCCATTT GTGTCTCGCA TCGGTAAATC	1560
	AGATTGTATG TTTCCCGAAG ATACTTGGA ATAAATGCCA TCTTTCATTG ATTACTATCA	1620
	TGAAAATGAA ATCTATCTCC TTATAAGTCA ATCAATCGTG CCGTCAACAT GCGGATGGGT	1680
30	TGATTGTTTT TCTTTGTATC CATCATATTT TTTGATTTCAT CTCCTCTTAT TGAAC TTGTT	1740
	CTTAATTATA AAATATAACA ATAGAATTAT TTATAATTAT TAAATTTAGA TGCATTAATA	1800
	TTATTGATAT TATTTTCAAA AACTAGAAAT ATTGATTGTG TGCATGTATA ATGTTAAAAG	1860
35	CGCCCTTTTA TAACGCTTAC ATATAAAAGC TTATTTAGGG AGAGGGATAT TCAACAAGGG	1920
	GGATTGAAA ATGATAGAAC TTAATGCAAT TACAACATTA TGTTTAGCTT GTATCCTTTA	1980
40	TTTACTTGGT AAGGCTATCG TTAATCACGT TAATTTTTTA AAACGTATTT GTATACCAGC	2040
	ACCAAGTATT GCGGCTTAA TCTTTGCTAT TTTAGTTGCG GCTTTGGATT CATTTGGCAT	2100
	GGTTAAGATT AAATTAGATG CTTCAATTCAT TCAAGATTTT TTCATGTTAG CATTCTTTAC	2160
45	GACAATCGGT CTTGGTGCA TTTGAAATT ATTTAAATTA GGTGGCAAAG TCTTGCTATT	2220
	ATACTTTATG TTTTGTGCTA TCATTTCACT CATTCAAAC ATAGTTGGTG TATCACTAGC	2280
	AAAAGTATTA AATATTAAAC CTTTGTTAGG ATTAACAGCA GGTTCATGT CTATGGAAGG	2340
50	CGGTATGGT AATGCTGCTG CTTATGGTAA GACAATTCAA GATTTAGGTA TTGATTCGGC	2400
	ACTGACAGCG GCTCTTGCA CTGCAACTTT AGGTCTTGTA TTTGGAGGGC TTATCGGTGG	2460
55		

	ATTTAAAGAT TATAGCCAAG TAGCATATAA CGAACATTTA CATAGTAAAT TTAATGCCAC	2580
	TGAAGTATTC TTCATTCAAT TTACAATCGT TGTATTCTGT ATGGCAGTTG GAAGTTATTT	2640
5	CAGTCATTTG TTTACAGCTC AAACAGGGAT TAATGTTCCA ATTTACGTTG GCTCATTATT	2700
	TGTAGCTGTT ATTGTCCGAA ATATCTCTGA AAGTTTAAAT TTTAATATTG TAGATTTAAA	2760
10	AATTACTAAT CAAATTGGCG ATGTCGCATT AGGTATTTTC TTATCTCTTG CGCTAATGAG	2820
	CATTCAATTA ATCGAAATTT ATAAACTTGC TATACCTCTT ATTATTATCG TTTTAGTTCA	2880
	AGTTGTCGTT ATGATTTTAT TTGCTGTTTT AATTTTATTT AGAGGTTTAG GAAAAGATTAA	2940
15	TGATGCTGCA GTAATGGTAG GTGGTTTTAT CGGTCATGGG CTTGGTGCAc GCCAAATGCC	3000
	ATGGCAAATT TAGATGTTAT TACTAAAAAA TATGGAACT CACCTAAAGC ATATTTAGTT	3060
	GTACCTATTG TTGGTGCATT CTTAATCGAT TTAATTGGTG TTATAGTCAT TATGGGATTC	3120
20	ATACAATGGT TTAGTTAAAC ACCAACTCA TAAATAAAAG AGGAGGCCTT CGCCTCcTcT	3180
	TTTATTTATC CTCGATGTAT ATTCAAGTTA CGTTGTTCTA TCCATGACAA TATTTCCGGA	3240
	CTAAATACGA TTTGTTTTTG TGTTAAGTCG TCAATATTTT TAGCATCTAA CATCGTCATT	3300
25	ATTGATTTCA TGTGTTCAAT AAATGATTCT ACATAAGCTA CTGTATGTGC AATGCCATTA	3360
	TTTTCAACTT GATTTAAAAA CGGACGTGAC ATACCAGTTG CCTTTGCACC AAGTGCTAAA	3420
	CTTTTAATTG CATCGAGTGG TGTACGTAAA CCACCACTCG CGAAACTGA AATTTCGCTT	3480
30	TGATAAGCCG TTGTTTCAAG TAATGACTCA ACTGTAGACT GTCCCATGA TGATAAGTAA	3540
	TCCATATCTT TATTTGCACG ACGTTCATTT TCAATATCTA CAAAGTTAGT ACCACCTTTG	3600
35	CCACTAACAT CGACATACTT GACGCCTATT TGTGTAAAGT CATGCATTAA TTCTTTGCTC	3660
	ATACCAAATC CAACTTCTTT TATAATGACT GGAACAGACA CTCGTGATAC AATCGACGCT	3720
	ATATTATCTA ACCAAGTCAC AAATTCACGA TTCCCTTCAG GCATAACTAA TTCTTGAGGA	3780
40	GAAATTAACAT GGATTTGTAA CGCTTGTGCC TCAAGTAATT CAACTGCTTC CAAAGCCTTT	3840
	TCTACTGGTA CGTCCGCACC AACATTGCTA AAAATCATGC CTTCAGGATT CATTTTTCGC	3900
	GCAATCGTAA ACGTCTCAGC CATGCGTGGA TTTCTCAATG CCGCATGTGT TGATCCAACT	3960
45	GCCATCGCTA AGCCAGTTTC TCTTGCAACT ACAGCTAGCT TTTCAATTGAT GTTTTTCGTC	4020
	CACTCGCTAC CACCCGTCAT TGCATTAATA TAAACGGAT ATGCCATCGT TAAGTCAGGC	4080
50	GTCTGTGATG TCAAATCGAT ATCATTTACA TTAATTGATG GGATAGAATG ATGCACAAAA	4140
	CGCATCTTAT CAAAATCTGA ATGCATTGCG TCAGATTGGG CCATTGCTAT TTCAACATGT	4200
55	TCATTTTTTC TCTGTTCTCT TTGAAAATCA CTCATGATTA AACCTACCTT TTCGTCATT	4260

	ATTACAGCTA AGCAAATATA ATATCCATAA TGTAATGTA ATGCCGGCAT ATTTACAAAG	4380
	TTCATACCAT AAATCCCAGC TATGAATGTT AACGGTGAAA ATATAACTGA TACTAATGTC	4440
5	AGTACTTGCA TAATACTATT CATTCTAAAT GACGTGTATG ACTCAAAATT TTCTCGTATT	4500
	TCGTTTGTC TTTCTTGAGC AGTACGAATG ATATTACGTT GCTTAATCAA GTGGTCATCG	4560
10	ATATGTTGAA TGTATAGCGA ATGTTTATTA TCTATAATCA AATCACCATT TTGTTTCATT	4620
	GTATCAATTA GCTCTTGCAT AGGAAACAGT ACACGTTTTA CTTTAATCAA ATCCGAACGT	4680
	AACTTAAAGA CACTATCCAT GACCATTTTA TTAAAGCGAT CATCTACATG GCGGTCTTCA	4740
15	AAATGATAAA CACTATCTTC AAGTGCATAT ACAAAGTTGA AATATTTATC AACCATCATA	4800
	TCTAAATTA ATATGACGAC ATCTGCACAA TCTAATCTG CATCTAATGT ATTCATATAC	4860
	TTATAGACTA CTTTATTTAA TGATTCCAAC GTTTGATGAT GATATGTTAC TAATACATTG	4920
20	TCTTGATATAA AAATATTTAG TGCTATTGGT GAATAGTTTG ACCCCATAAT ACTATGGAAT	4980
	ACTAAGTATT GATAATCTTT ATAAGATTTA TATTTAGCTC GTGGCATACC GTTAATTGCA	5040
	TCATCCACTT CTAAATCATT AAAATTAAAA TGTGCTTTAA ACCATTCAAT TTCTTGTTCA	5100
25	TTCGGTTCAT CAAATCATA CCAAACAATA GTCGCATCTT TTGGTATCTC TTTGATATCA	5160
	TCAACTACTT TAAACGGTTC ATATGTAGTT TGATACCGTA TCTTTAAAGC CATCGATACT	5220
	CCCCCTAAAT AACGAATTCT CTATTATTTT ATCATGAATT AAATAACGTG TATGTCTTAA	5280
30	TTTATTTTAG TATGATAGTC ACTAAGGAGA TGGTTATTAT CAAACAACCT TTTACACATA	5340
	CTCAAACCGT AACATCTGAA TTCATTGACC ATAACAATCA TATGCATGAT GCAAATTATA	5400
35	ATATCATTTT TAGTGACGTC GTGAATCGTT TTAATTACAG CCACGGTCTT TCTTTAAAAG	5460
	AACGCGAAAA TTTAGCATAT ACGCTATTTA CACTAGAAGA ACATACGACA TACCTCTCAG	5520
	AATTGTCTCT TGGCGATGTA TTTACTGTTA CTTTATATAT TTATGATTAC GATTATAAGC	5580
40	GGTTGCATTT ATTTTAAACA TTAACATAAG AAGATGGTAC ACTAGCATCA ACAAATGAAG	5640
	TAATGATGAT GGAATTAAT CAGCACACAC GTCGTTCTGA TGCTTTTCCT GAATCATTTT	5700
	CAACACAAAT AGCACACTAT TATAAAAATC AATCAACTAT CACTTGGCCT GAACAATTAG	5760
45	GACATAAAAT AGCAATTCCA CACAAAGGAG CATTAAAATG ACAGATGCAT TACAACAAAA	5820
	GATTCATATC GAATTACTAG ATTTATTAGA TGATGTTAAG TTTGAATTAA CAGAATTAAA	5880
	TGCACAAAAA GGGTTATACA TTAACGGACC AGCAAATCAG CTACTTAAGC GTGGCGTGCA	5940
50	TATGGCTTAT GTTCAAGGAC AAAAGCAAGC CATCGATAAT ATTATGACTA TTGTGGAACA	6000
	ACAGCTTGAA AGATCAACAT TTCCTAGAAC ATTATGATAA ATTTCAAAT GAGGTGCTC	6060
55		

	ATAATTTTTT AGATCAATTT TATCAAATTA AAGGGCAATA CTTTATCATC ACACATATCA	6180
	ATACACTTAT TGGTGATTTT CACTCAGAAG CTCATTAACA ATTAGTCTAT ATAACCCTTG	6240
5	CTATATTTTC AAAAACAAAA CCCAATTACG TTTTCATGTC AAATATCATC TTGCATGAAA	6300
	TCGTAAC TGG GTCATTTATA TGTTATTAGT TATTTTGTGT TACATCCTCA TCTATCGATT	6360
10	TGGCAATTTG TTTAATAGCT TTATGTGATT GTCTAATTGG ATAAATTGGA AAATCATGTA	6420
	CCATCTTAGG ATAATCATAA AACTCAATGT ATTGATGATG TTGCAACATC ATTTGTTCAA	6480
	ATAGCTTCAT ATCAGGATGT GTCATTTTAC GTCCACCACC AAACATATAA ACTGGTGGCA	6540
15	ATCCTTCTAT TGTGCCATTA ATTGGCGATA TGCGCTTATC TGTTAATGGT AGGCCATTG	6600
	CCCATTTTTT CATAATCTCA TTGACACCAA ACTGACTTAG aACCGCATCT TGTTGATT	6660
	AGGCGTCCGA AATATCTTTA TTAGATAGTG TTGCATCTAA AATTGGTGAG ATTAAATACA	6720
20	ATTTATTCGG TAATGGCTGT TGATTakCTA AAAGAGATTG TACAAAGGAT AATGCCAGTG	6780
	CACCACCTGA ACCATCACCC ATGACTACGA CATTTTGATG TCCTACTTCA GATACTAATT	6840
	GaTCATAAAC ACGTTGTATC GCTTGGnAAA GTATCGTcaA TATGnAAACT CTGGTGTCTT	6900
25	TGGATAGATA GGCAGTACAA CCTCATATAA TGtACTTAAA GTGATTTTAT CCCAACAATC	6960
	TCCAATGGAA CGGTGATGGT TGTAGTGCAT TGAATCCACC GTGAATATAT AAAATTTTCT	7020
30	TATCAATTTG ATGTCTGAAA TTAAAGCGAA AGACTTGCAT ATCATCTAAT GACAATTTTT	7080
	CTAAATTTGC TTTAACATTT AATGTTGAAG GCTGCTTATG TTTTTTTCTA TTTTCAATTT	7140
	CTCTTTTATA AAAAAATCTT TCAACATCTT GATCATTTTT AAACATAATC GAGCGATTGT	7200
35	GAAGCAAATA TTTATTGACA ACGCTATTCA TAACACGGTT TCTAATCAAT GTCTTAACCT	7260
	ACGTTTATAT ATTTTATGTA TCCAATGATk GTCTATCCCC TACATTCTTT GCCAAAAAAA	7320
	GTATATAATG TAGAAGATAT TTTCTTTTTC ACTTTCAAAT TTAAGACTAC AATTGAACAG	7380
40	TGATTTTTC TCAATTATAAC AGACAACTAG ACATATTGAT AAGTAAAGAA AAGAACTTTA	7440
	TACGGAGGTA CCTTGCATGA CAAATCCAAA TCAACGATTA GAACCATTG ATGAGACATT	7500
	TCAACAACCG AATATTCATC GTGGTAAGCG ATATGGTAAG AAAAAACGTT CATTGGTAAG	7560
45	CATGATTATT CAAATCATTG TTGTWATATT AACCACCATC GCTGGAATAC AGCATGGTGG	7620

(2) INFORMATION FOR SEQ ID NO: 37:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 9834 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 37:

	GTCATTACCG amTTTCTTAG AaTCATTTAA AGATGATAAA TATACAAACG TTGGTAATTT	60
5	AAAAGAAGTG AATTTTGATA AAATTGCTGC GACGAAACCC GAAGTAATCT TTATCTCTGG	120
	ACGTACAGCT AATCAAAAGA ATTTAGATGA ATTCAAAAAA GCTGCACCTA AAGCGAAAAT	180
	TGTTTATGTT GGTGCAGATG AAAAGAACTT AATTGGTTCA ATGAAACAAA AACTGAAAA	240
10	TATCGGAAAA ATTTACGATA AAGAAGATAA AGCTAAAGAA TTAAATAAAG ATTTAGATAA	300
	CAAAATTGCT TCAATGAAAG ATAAAACGAA AACTTCAAT AAAACTGTTA TGTATTTACT	360
	AGTTAACGAA GGTGAATTAT CAACATTTGG ACCTAAAGGT CGTTTGGTG GATTAGTTTA	420
15	CGATACATTA GGATTCAATG CAGTTGATAA AAAAGTAAGT AATAGCAATC ATGGACAAAA	480
	TGTTTCTAAC GAATATGTTA ATAAAGAAAA TCCAGATGTT ATTTTAGCGA TGGATAGAGG	540
20	TCAAGCGATA AGTGGTAAAT CACTGCGAA ACAAGCATT AATAATCCTG TATTAAAAAA	600
	TGTTAAAGCA ATTAAAGAAG ACAAAGTATA TAATTTAGAT CCTAAATTAT GGTACTTTGC	660
	AGCTGGATCA ACTACAATA CAATTAAACA AATTGAGGAA CTTGATAAAG TTGTAAAATA	720
25	ATTTTAAAG AGGGGAACAA TGGTTAAAGG TCTTAATCAT TGCTCCCTC TTTCTTTAA	780
	AAAAGGAAAT CTGGGACGTC AATCAATGTC CTAGACTCTA AAATGTTCTG TTGTCAGTCG	840
	TTGGTTGAAT GAACATGTAC TTGTAACAAG TTCATTTCAA TACTAGTGGG CTCCAAACAT	900
30	AGAGAAATTT GATTTTCAAT TTCTACTGAC AATGCAAGTT GGCGGGGCC AAACATAGAG	960
	AATTTCAAAA AGGAATTCTA CAGAAGTGGT GCTTTATCAT GTCTGACCCA CTCCCTATAA	1020
	TGTTTTGACT ATGTTGTTTA AATTCAAAA TAAATATGAT AGTGATATT ACAGCGATTG	1080
35	TTAAACCGAG ATTGGCAATT TGGACAACGC TCTACCATCA TATATTCATT GATTGTTAAT	1140
	TCGTGTTTGC ATACACCGCA TAAGATTGCT TTTTCGTTAA ATGAAGGCTC AGACCAACGC	1200
40	TTAATGGCGT GCTTTTCAAA CTCATTATGG CACTTATAGC ATGGATAGTA TTTATTACAA	1260
	CATTTAAATT TAATAGCAAT AATATCTTCT TCGGTAAAAT AATGGCGACA scgTGTTTCA	1320
	GTATCGATTA ATGAACCATA AACTTTAGGC ATAGACAAAG CTCCTTAACT TACGATTCTT	1380
45	TTGGATGTTT ACCAATAATG CGAACTTCAC GATTTAATTC AATGCCAAAT TTTTCTTTGA	1440
	CGGTCTTTTG TACATAATGA ATAAGGTTTT CATAATCTGT AGCAGTTCCA TTGTCTACAT	1500
	TTACCATAAA ACCAGCGTGT TTGGTTGAAA CTTCAACGCC GCCAATACGG TGACCTTGCA	1560
50	AATTAGAATC TTGTATCAAT TTACCTGCAA AATGACCAGG CGGTCTTTGG AATACACTAC	1620
	CACATGAAGG ATACTCTAAA GTTTGTTTAG ATTCTCTACG TTCTGTTAAA TCATCCATTT	1680
55		

EP 0 786 519 A2

	AGTGTCTCTT TTGAATAATG CTATTACGAT AATCTAACTC TAATTCTTTT GTTGTAAGTT	1800
	TAATTAACGA GCCTTGTTTCG TTTACGCAAA GCGCATAGTC TATACAATCT TTAACCTCGC	1860
5	CACCATAAGC GCCAGCATTG ATATACACTG CACCACCAAT TGAACCTGGA ATACCACATG	1920
	CAAATTCAAG GCCAGTAAGT GCGTAATCAC GAGCAACACG TGAGACATCA ATAATTGCAG	1980
	CGCCGCTACC GGCTATTATC GCATCATCAG ATACTTCGAT ATGATCTAGT GATAATAAAC	2040
10	TAATTACAAT ACOGCGAATA CCACCTTCAC GGATAATAAT ATTTGAGCCA TTTCCTAAAT	2100
	ATGTAACAGG AATCTCATTT TGaTAGGCAT ATTTAACAAC TGCTTGTAAT TCTTCATTTT	2160
	TAGTAGGGGT AATGTAAAAG TCGGCATTAC CACCTGTTTT AGTATAAGTG TATCGTTTTA	2220
15	AAGGTTCAAT AACTTTAATT TTTTCATTG GGATAAGTTG TTGTAAAGCT TGATAGATGT	2280
	CTTTATTTAT CACTTCTCAG TACATCCTTT CTCATGTCTT TAATATCATA TAGTATTATA	2340
20	CCAATTTTAA AATTCATTG CGAAAATTGA AAAGAAAGTA TTAGAATTAG TATAATTATA	2400
	AAATACGGCA TTATTGTCGT TATAAGTATT TTTTACATAG TTTTTCAAAG TATTGTTGCT	2460
	TTTGCATCTC ATATTGTCTA ATTGTTAAGC TATGTTGCAA TATTGGTGT TTTTTGTAT	2520
25	TGAATTGCAA AGCAATATCA TCATTAGTTG ATAAGAGTA ATCAAGTGCA AGATAAGATT	2580
	CAAATGTTTG GGTATTCATT TGAATGATAT GTAGACGCAC CTGTTGTTTT AGTTCATGAA	2640
	AATTGTTAAA CTTCGCCATC ATAACCTTCT TAGTATATTT ATGATGCAAA CGATAAAACC	2700
30	CTACATAATT TAAGCGTTTT TCATCTAAGG ATGTAATATC ATGCAAATTT TCTACACCTA	2760
	CTAAAATATC TAAAATTGGC TCTGTTGAAT ATTTAAAATG aTGctACCGC CAATATGTTT	2820
	TGTATATTTT ACTGGGCTGT CTAAGAGGTT GAATAATAAT GATTCAATTT CAGTGTATTG	2880
35	TGATTGAAAA CAATTAGTTA AATCACTATT AATGAATGGT TGAACATTTG AATACATGAT	2940
	AAAGTcCTTT GATATTGAAA ATTAATTTAA TCACGATAAA GTCTGGAATA CTATAACATA	3000
40	ATTCATTTTC ATAATAAACA TGTTTTTGTA TAATGAATCT GTTAAGGAGT GCAATCATGA	3060
	AAAAAATTGT TATTATCGCT GTTTTAGCGA TTTTATTTGT AGTAATAAGT GCTTGTGGTA	3120
	ATAAAGAAAA AGAGGCACAA CATCAATTTA CTAAGCAATT TAAAGATGTT GAGCAAAAAC	3180
45	AAAAAGAATT ACAACATGTC ATGGATAATA TACATTGAA AGAAATTGAT CATCTAAGTA	3240
	AACTGATAC AACTGATAAA AATAGTAAAG AATTTAAGGC ACTACAAGAA GATGTTAAAA	3300
	ACCATCTCAT ACCTAAATTT GAAGCATATT ATAAGTCAGC AAAAAATTTG CCTGATGATA	3360
50	CAATGAAAGT TAAGAAATTA AAAAAAGAAT ATATGACGCT TGCAAATGAG AAGAAGGATG	3420
	CGATATATCA ATTAAAAAA TTCATAGGTT TATGTAATCA ATCTATCAAG TATAACGAAG	3480

55

EP 0 786 519 A2

	AATTAGCTGA TAATAAAAGT GAAGCAACTA ATCTTACGAC AAAATTAGAA CATAATAATA	3600
	AAGCGTTAAG AGATACTGCG AAGAAGAACC TAGATGATAG TAAAGAAAAT GAAGTAAAAG	3660
5	GCGCGATTAA AAATCACATT ATGCCAATGA TTGAAAAGCA AATTACCGAT ATTAACCAAA	3720
	CTAATATTAG TGATAAGCAT GTTAATAATG CAAGGAAAAA CGCAATAGAA ATGTATTACA	3780
	GTCTGCAGAA CTATTATAAT ACACGTATTG AAACAATAAA GGTTAGTGAG AAGTTATCm	3840
10	AAGTCGATGT AGATAAGTTG CCGAAAAAGG GTATAGATAT AACTCACGGC GATAAAGCCT	3900
	TTGAAAAAAA GCTTGAAAAA TTAGAAGAAA AATAACTATA ATCATTTTTC AAAGTTAAAA	3960
15	ATTTTGAATT TATGGTTAAC ATGTCAACTT ACTATGTGTA TAATGGTAAA CATTGATATT	4020
	AACTATATGT ATAAAAATGT CACGCAGATG CTATTTAAAT GTGATAAATA TTTTtagagg	4080
	TGAATAGAGT GGCTATAAAG CTAAGTTCAA TTGACCAATT TGAACAGGTT ATTGAGGAAA	4140
20	ATAAATATGT TTTTGTATTA AAACATAGTG AAAGTTGTCC AATATCGGCA AATGCGTACG	4200
	ATCAATTTAA TAAATTTTAA TATGAACGCG ATATGGACGG TTATTATTG ATTGTCCAAC	4260
	AAGAACGCGA TTTGTcagat TATATTGCTA AAAAAACGAA CGTTAAACAT GAATCACCTC	4320
25	AAGCATTTTA TTTTGTAAAT GGTGAAATGG TTTGGAATCG AGACCACGGT GATATCAATG	4380
	TGTCGTCATT AGCACAAGCA GAAGAATAAT GAACTATAG GGTGGAACA TTTTGCCTTA	4440
	CACTACTAGA CGTGAATAGC ACAACTTAAA TTCGTGTGAA TCAGAGTAGT TTGGCTATAA	4500
30	TGATGTTCTG ACCTTTTtatt TTATGTCACC TTTAGAAGCA GTTAAGTTAG TACTTTTTTA	4560
	CAAACATATG TATAATATAT TCGAGTATTT TTATTGAAa tATTTTGGAA AACGACGAAT	4620
	CCAATAAGAA AATTTAAACA TGATTTGTAA GTTAGTTTAA TAGGAAATAT ATGCTAAACC	4680
35	AAAAGAAGCA TATTGTTATT TACTGGAATA ATTAATAATC ATGTCATGTT AAATGTTAGC	4740
	ATATAATCAC GAGATAAAAT CTAAAATTTA AGATTAATCT TTTATGAATA AAAAACGTAT	4800
40	CACAACAAAT AATAAAGTAA GGTGGTCAAG GTTATGAAAG TATTAGTAGC CATGGATGAG	4860
	TTTCATGGAA TTATTTCAAG TTATCAAGCT AATAGATATG TTGAAGAGGC AGTTGCAAGC	4920
	CAAATTGAAA CTGCAGATGT AGTTCAAGTA CCATTGTTTA ATGGAAGACA TGAATTATTA	4980
45	GATTCTGTAT TTTTATGGcm ATCTGGGcaA AAGTATCGTA TACCAGTACA TGATGCAGAT	5040
	ATGAATGAAG TTGAAGGTGT TTACGGACAA ACTGATACAG GGATGACCGT TATCGAGGGG	5100
	AATTTATTTT TAAAAGGTAA AAAACCAATT GTTGAACGAA CAAGTTATGG TTTAGGAGAA	5160
50	ATGATTAAAC ATGCATTAGA TAACGACGCA AAACATGTTG TAATTTCACT AGGTGGGATT	5220
	GATAGTTTTG ATGCTGGTGC AGGTATGTTA CAAGCATTAG GTGCTCAATT CTATGATGAC	5280
55		

	GATATGTCGA ACTTACACCC TAAATGGAA ACAGCAAGAA TTCAAGTAAT GTCGGATTTT	5400
	TCAAGTCGAT TATATGGTAA GCAAAGTGAA ATCATGCAAA CTTATGATGC GCATCAGTTG	5460
5	AATCATAATC AAGCAGCAGA AATCGATAAT TTAATTTGGT ATTTTAGTGA GTTATTTAAA	5520
	AGTGAATTGA AAATTGCAAT TGGTCCAGTT GAACGTGGTG GTGCTGGTGG TGGAAATTGCA	5580
	GCAGTCTTGA ATGGACTGTA TCAAGCTGAA ATATTAACCA GTCATGCATT AGTAGACCAA	5640
10	CTAACACATT TAGAAAATTT AGTTGAACAA GCGGATTTAA TTATTTTGG AGAAGGATTA	5700
	AATGAAAATG ATCAGTTGCT AGAAACGACA ACATTGCGTA TTGCAGAACT TTGTCATAAA	5760
15	CATCAAAAGG TTGCCATTGC AATTTGTGCA ACTGCTGAAA AGTTTGATTT ATTGAATCA	5820
	CAAGGGGTTA CAGCAATGTT TAATACATTT ATCGATATGC CAGAACTTA TACTGACTTT	5880
	AAAATGGGtT ACAAATTAGG CATTATACGG TTCAGTCTTT AAACTGTTG AAAACACATT	5940
20	TTAATGTTGA GGTTTAGTAA AGAAGGACTA AATTGGTGAT GCTGTCATGA TGGTTAATAA	6000
	CATTTATGAT GGTTAGCAAA ACGAATTAGA AGATCGAAAG TATACGTAAA AAATATGAAA	6060
	AATCAGCTA TCATTGCACT GAATGTTAGC GTGATTTTAA TATATTAATT AAGCCTGAGT	6120
25	TGAACTAGTA TATAATCGTT GGTTTTTAGT GATTTTCAGC GATATCTTCT ACAATTCCAA	6180
	TGATTACTTG TACTGCTTTT TCCaTAACAT CAATGGATGC aTATTCATAT GGGCCGTGGA	6240
	AGTTACCGCA ACCTGTAAAG ATGTTTGGAG TTGGTAACCC CATAAATGAC AATTGTGAAC	6300
30	CATCTGTACC ACCGCGAATA GGTTCAGTGT TTGCTGGAAT ATCTAATTTG GCAAAGACAC	6360
	GTTTAGGTAT ATCAATAATA TGAGGCAATG GTAATATTTT TTCTGCCATA TTGAAATATT	6420
	GATCCGATAT ATCAACTTTA ACTGGATAAT TTTCAAAATG GGCATTGATA TCGTCACGTA	6480
35	TTTCTAAAAT ACGTTTCTTA CGCAATTCGA ATTGTTTTTT ATCATGATCA CGAATAATGT	6540
	ATTGCAAAGT TGCTTTTTCA ACAGTTCCTT CAAAGTTCAT TAAGTGATAA AAGCCTTCGT	6600
	ATCCTTCTGT TCGCTCCGGA ACTTCACTAT CAGGTAGCAA ACTATCGAAT TGTTACCTA	6660
40	AACGTATTGC GTTTACCATT GCATTTTtag CTGAACCAGG ATGAACATTT ACACCGTGGC	6720
	ATGTAATAAC CGCTTCAGCA GCGTTAAAGC TTTCATATTG TAATTCTCCA TATTGACTAC	6780
45	CATCCATAGT ATAAGCAAAA TCAGCATTGA AGCGGTCAAC ATCAAATTTA TGTGGACCAC	6840
	GACCGATTTT TTCGTCTGGT GTAAATCCAA TGCGAATGGT ACCATGTTTA ATTTCTGGAT	6900
	GTTCTTGTA ATAACAAATA GCTTCCATAA TTTCCACAAT ACCCGCTTTA TCGTCTGCAC	6960
50	CTAGTAACGA TGTACCATCA GTTACCATTA ATGTATGACC AACTAAACTG TTAAGTTCTG	7020
	GAAATACTTT AGGATCTAAG ACACGTTTAG TATTGCCTAG TTTGTATGGC TTACCATCAT	7080

55

EP 0 786 519 A2

	GCGCCAAAAA TCCAACGTGT GGGACGTCGA CATCGATGTT ACTTTCTAAT GTAGCAAATA	7200
	AGTAGCCATT TTCATCTAAA TCAGTTGGCA ATCCTAATTG TTGTAATTCT TTTTCTAATA	7260
5	AATGTAACAA ATCCCATTGC TTTTCAGTTG AAGGTGTTGT TGTAGATTTT GGATCAGATT	7320
	GCGTATCAAT TGTCGTATAT CTTGTTAATC TATCTATCAA TTGGTTCTTC ATTATATTCG	7380
	ACCCCTTAAA CTCTATTATT CATGTTGTAA GATTTTTTAT ATGTCTTACC TTTGATTTTA	7440
10	CCATACAGTT GTTTGATACG TGTGTATAGG TAATATAGAA TTTCAGAAAC TAATATACCG	7500
	AAAGCAATCG CACCTGAAAT CAGTGTACTT CTAAAAATGT ATTTACAGCA CTTGTATAAT	7560
	CATTTGATAC TAAAAAACGA GTCGCTTGAT AAGCTGCACC ACCAGGTACT AATGGTATAA	7620
15	TGCCTGGCAC TATGAATATA ATTACCGGTC GTTTATATCT GCGACTCATA GTATGACTCA	7680
	TTAAGCCTAA AATTAAGCTT CCCAAAAATG AAGCGCCAAC TTTTCCAAAC TCTAAATCTA	7740
	CCGTTAATTG GTAAATCGTC CATGCAATGG CACCCACAAA TCCACATGCT ACTAAGAGGC	7800
20	GTTTGGGTGC ATTGAAAATG ATAGAGAAAA GTACTGTTGA TATAAAGCTG ATTGTAAAAT	7860
	GAAATAAATA AAATAGCATG CTTTAACAGT CCTTCCTTAA ATGATTAATA AAACGATTGC	7920
25	GACACCAGCA CCGATTGCGA ATGCTGTTAA TGCAGCTTCA ACACCGCGAG ACATACCTGC	7980
	AAGTAATTCA CCCGCTAATA AATCTCGAAT GGCATTGGTA ATTAATATAC CAGGGACAAG	8040
	TGGCATGACA CTGGCTATAG TAATGATATC TTGATTGGTT GCAATGCCTA ATTTAGTAAA	8100
30	TGTGGCTGCA ATGGATATGA CCACAGCGGC TGCAACAAAC TCTGAGAAAA ATTTAATTTG	8160
	TATATAGCGT TGCACAAAGC TGAATGTTAA AAATGCGGAT CCGCCAGCAA TGAATGCAAT	8220
	CCAACAATCT GATGCGACAC CACCAAACAT AAATAGGAAG AAGCCACATG CAATGGCAGC	8280
35	TGCAAGAAAA TTCGTTAAAA AAGAATATTG TAATGATGCA TGCTGTAAAT GAATAAATTC	8340
	AGATTTAGCT TCATCAATTG TGAGTTCTTT ATTTGATATT TTACGTGAAA GACTATTCGT	8400
	TAAAGCGATT TTCTCTAAAT CTGTTGTACG CTCTTGACA CGAATTAATC TTGTACTTGT	8460
40	TCGATCGTTT AATGAAAAAA TAATTGCAGT TGAAGTACA AAATATATG TATTATGAAG	8520
	ACCATAACTA TGTGCGATAC GGTTCATTGT ATCTTCAACT CGATATGTTT CAGCACCTGA	8580
45	TTCaAGTAAA ATTCTACCTG CAATTAATAC AACATCAATC ACTTTGTTTT CATCTATAAT	8640
	TGTGATTGAA TCTGGCATAT CAATTCACCT CCAATGATAT GTGTTATTTA TTTGAACAAT	8700
	TGaAGTTTAC AACTTGTTGT TACAACTTTC AATAGTGAGA CTTTGTGTTA GTATGATGAA	8760
50	CTTGATGGT TCAAAATTTAA ATAAGAAAAA CTGTTAATCT TTGCTATTAT ACTATGATTT	8820
	AATAATAGCA AAGGATTAAC AGTTTTGTCTG TTGTTATAAA TTGATAATAG GGTAAACAT	8880
55		

TTTACGCTGT GATTTTGGAT CGTCATCTGT TAAATAACCA ACACCGATAG AACTGACAA 9000
 TTTAATAACT TCTTTGTTTG GTAAATGGAA TGATGATTTT TCAACACCCG AACGAATATT 9060
 5 TTCAGCTAAT TTAACACTTT GATCAAGTGA ATAATTGTGA ATGACAACCTG AGAACTCTTC 9120
 GCCACCATT CTAAAAATTT TAAATTGATT CGGCACATAG TTTTAAAGTA ATTGAGACAT 9180
 TTGTTTTAAT ACAGCATCAC CTGATTGTG TGAGTAGGTA TCATTGaCAT CTTTAAATCC 9240
 10 ATCGATATCG ATTAATAATA ATGCGATACT TTGATGTTCT TTTTCAGCTT TTCGTGAAAT 9300
 TTCATTTAAA TGTCTATCAA ATTCTTTTAC ATTACCTAAG CCTGTTAAGT AATCATATTT 9360
 15 ATCTTCGTTT TCATAACGAT TTACGAGTGA GAAGAAATGC CAAATATCGA CAAATGTTAT 9420
 CGCTGAAGCT AAAGTGATAA TTAATGAAAT TGGTATTAAA ATGATAACTT CCGATAGTGT 9480
 GTAAATAGGA CTCCTAACG CGACACCAAA TAAAATGATT ATTGTAACAA CATTAGTAT 9540
 20 TAATAATGAT AGCACATCAT TTTGTTTTAA AAATGGTCCA ATAGCACTTG TTAGTGCAGC 9600
 AATAACAATC AACGTAACAC CGTACATAAT CGAGTTGTTA AATACTACAA TTTCAACAAT 9660
 TGCTACAATT ACTGTGGCAG ATAATGTATA GACCATATTT GTAAATCTAC CTAAAAACAA 9720
 25 TAAAGGAACG AATGTTAAGT GAATTAAATA ATCTTCACGA TAAGGGATAG GGTAGACAGA 9780
 TAATAATAAT GATACGATTG TCATTAAAAC AGTGACATAA GCCTTAGAAA AAAC 9834

(2) INFORMATION FOR SEQ ID NO: 38:

- 30 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 23439 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 35 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 38:

40 TCTCAATCAG ATGAAAAATT GCATATCGTA GGTTTTACAG AAAGTGCAAA ATATAATGCG 60
 TCATCAGTCA TTTTCACGAA TGACGCTACC ATTGCCAAGA TCAATCCTAG ATTGACTGGA 120
 GATAAAATTA ATGCAGTTGT TGTACGTGAT ACAAATTGGA AAGACAAAAA ATTAAACCAA 180
 45 GAGCTTGAAG CGGTAAGTAT TAATGACTTT ATTGAAAATT TACCAGGTTA TAAACCACAG 240
 AACTTAACAT TAACTTTTAT GATTTTATTTC TTATTTGTCA TTTTCAGCTAC AGTTATAGGC 300
 ATTTTCCTAT ATGTCATGAC ATTACAAAAG ACGAGTTTAT TTGGCATATT AAAAGCTCAA 360
 50 GGATTTACGA ATGGCTATTT GGCGAATGTG GTAATTTTCGC AGACGGTCAT ATTAGCACTA 420
 TTTGGTACGG CATTGGCTT ACTGTTAACA GCGTTACAG GTGCATTTTT ACCTGATGCA 480

55

EP 0 786 519 A2

	TCTGTATTAG GAAGTTTATT CTCCATTTTA ACAATTAGAA AAATAGATCC GTTAAAGGCG	600
	ATTGGGTAGG AGGTGTAGCA AATGTTGAAA TTTGAAAATG TAACAAAGTC ATTTAAAGAT	660
5	GGGAATCGTA ACATTGAAGC GGTAAAGAT ACAAATTTTG AGATAAATAA AGGTGATATT	720
	ATAGCATTGG TTGGACCTTC TGGCTCTGGT AAAAGTACAT TTCTAACTAT GGCAGGTGCT	780
	TTACAAACAC CGACATCTGG GCACATTTTA ATCAATAACC AAGATATTAC GACAATGAAG	840
10	CAAAAAGCAT TGGCAAAAGT TAGAATGTCT GAAATAGGTT TTATTTTACA AGCTACAAAC	900
	CTTGTACCAT TTTTAACGGT AAAGCAACAA TTTACATTAT TGAAAAAGAA AAATAAGAAT	960
15	GTTATGTCTA ATGAAGACTA TCAGCAACTT ATGTCACAAT TAGGTCTAAC TTCATTGCTT	1020
	AATAAGTTAC CTTCAGAAAT TTCAGGTGGT CAGAAACAAC GTGTGGCGAT AgCaAAGCGT	1080
	TATATACGAA TCCGTCGATT ATTTTAGCGG ATGAACCTAC CGCGGCGTTA GATACTGAAA	1140
20	ATGCGATTGA AGTCATTAAA ATTCTACGTG ATCAAGCCAA ACAAAGAAAG AAAGCATGTA	1200
	TTATTGTTAC ACATGATGAA CGACTTAAAG CATATTGTGA TCGTTCATAT CATATGAAAG	1260
	ATGGCGTCTT TAATCTTGAA AATGAAACAG TAGAATAGTT TTATTAAGCC GGTACATCAT	1320
25	GTGCCGGTAT TTTTATGTTT ATGTATTATT TGAATAAACT TTCACATTCA ATTAATAATA	1380
	ATTATTATCG AAAATCAGAA ATATCCGTG AAATATAATA TTTTTGTAG TAAAATGGCC	1440
	TCTAAGTATT CAATATTTAA ATATGGGGAT TGAATATAAA ATTATCGTAA TGGGGGTCAA	1500
30	TGGTTATGGA TTTATTGATA GGTACTTTAT TTTTATTTT GGTCTTAGTG ATTTTACAT	1560
	TATTTACATA TAAAGCGCCT AATGGTATGC GTGCCATGGG AGCATTAGCT AATGCAGCAA	1620
	TCGCAACATT TTTAGTGGA GCAATTAATA AATATGTTGG TGGCGAAGTA TTCGGTATTA	1680
35	AATTTTLAGA AGAGCTAGGA GACGCTGCGG GAGGTCTAGG TGGTGTCGCT GCCGCTGGAT	1740
	TAACAGCATT AGCTATCGGT GTGTCACCAG TATATGCATT AGTTATAGCA GCCGCGTGCG	1800
40	GTGGTATGGA TTTATTACCA GGTTCCTTTG CGGGTTATAT GATTGGATAT GTGATGAAAT	1860
	ATACAGAGAA ATATGTGCCG GATGGTGTG ACTTAATTGG ATCGATTGTC ATCTTAGCGC	1920
	CATTAGCTCG TCTTATTGCA GTATTATTAA CGCCAGTAGT GAATAGTACA TTGATTGCAA	1980
45	TTGGTGATAT TATCCAAAGT AGTACGAATA CGAATCCAAT TATCATGGGT ATCATTTTAG	2040
	GTGGTATTAT TACGGTTGTC GGCACAGCGC CATTGAGTTC AATGGCATTG ACAGCATTAT	2100
	TAGGTTTAAAC GGGTGACCT ATGGCTATTG GTGCCATGGC AGCATTTAGT TCGGCATTTA	2160
50	TGAATGGGAC GCTATTCCAT CGCTTAAAT TAGGTGATCG TAAGTCTACG ATTGCAGTAA	2220
	GTATTGAACC TTTATCACAA GCAGATATTG TATCAGCCAA TCCAATTCCA ATCTATATTA	2280

55

EP 0 786 519 A2

	ATGCGACAGG TACAGCTACA CCGATTGCAG GATTTTTAGT TATGTTTGGA TTTAATCATC	2400
	CGACGACAAT TGTGATTTAT GGTGTAGTAA TGGCGATTGT AGGTGCGCTT GCAGGTTATC	2460
5	TTGGTTCAAT TGTATTTAAA AAATATCCAA TTGTTACTAA GCAAGACATG ATTAATCGAG	2520
	GTGCAGTAGA CGCATAGCAT CATCATATTG AATAGTAAAA ACAATAAAAA CATAGTAACG	2580
	TGATTCACTC GATGTAACAG TCGATAATGA GTCACGTTTT TTTATAGAAA AATACAAGAC	2640
10	ATAAAAATGT CATAATTTAT TGTGACAAA TATCATACTG TATAAACATT TATCATTTTC	2700
	TCAAGTACCT TTTACACGAT GGAATGAACT TACTTTTTAC GAAATTATGC GTATTTTATA	2760
	AACAAATATC ATTGATATAA CGGTAAATGT AAGCGTTTAC AACAGAAATA ACAGCATGCT	2820
15	ACGATATTTT TGTAAATTCA CTGATTCAAG TATTTTAAAGT CAATATGAGG AGGGATGTTA	2880
	TGAGCGATTG TGAGAAAGAA ATTTTAAAAA GAATTAAAGA TAATCCGTTT ATTCAACAAC	2940
	GTGAACTTGC TGAGGCAATT GGATTATCTA GACCCAGCGT AGCAAACATT ATTCAGGAT	3000
20	TAATACAAAA GGAATATGTT ATGGGAAAGG CATATGTTTT AAATGAAGAT TATCCTATTG	3060
	TTTGTATTGG CGCAGCGAAT GTAGATCGTA AGTTTTATGT GCATAAAAAT TTAGTTGCAG	3120
25	AAACATCAAA TCCTGTAACG TCAACACGCT CTATTGGTGG CGTAGCAAGA AATATTGCTG	3180
	AGAACTTAGG TAGGCTTGGC GAAACGGTCG CTTTTTATC TGCTAGTGGA CAAGATAGTG	3240
	AATGGGAAAT GATTAAACGA TTGTCCACAC CATTATGAA TTTGGATCAT GTTCAACAAT	3300
30	TTGAAAATGC GAGTACAGGT TCATATACAG CTTTAATTAG TAAAGAAGGC GACATGACAT	3360
	ATGGCTTgC AGATATGGAA GTGTTTGACT ACATTACGCC TGAATTTTTA ATTAAGCGTT	3420
	CACACTTATT GAAAAAGGCT AAGTGCATTA TTGTAGATTT GAATTTAGGC AAAGAGGCAT	3480
35	TAACTTCTT ATGTGCCTAT ACCACGAAAC ATCAAATCAA ATTAGTTATC ACCACGGTTT	3540
	CTTCCCCAAA AATGAAAAAT ATGCCTGATT CATTACATGC TATTGATTGG ATTATCACGA	3600
	ATAAAGATGA AACAGAAACA TACTTAAATT TAAAAATAGA ATCTACTGAT GATTTAAAAA	3660
40	TAGCTGCTAA ACGCTGGAAT GATTTAGGTG TTAAAAATGT TATTGTGACA AATGGCGTGA	3720
	AAGAACTCAT TTATCGAAGT GGTGAGGAAG AAATCATTAA GTCAGTTATG CCATCAAATA	3780
45	GTGTGAAAGA TGTTACAGGT GCAGGCGATT CATTCTGTGC TGCAGTAGTG TATAGCTGGT	3840
	TAAATGGGAT GTCTACTGAA GATATATTAA TTGCTGGTAT GGTTAACGCA AAGAAAACGA	3900
	TAGAAACGAA ATATACAGTT AGGCAAAACC TAGATCAACA GCAACTTTAT CACGATATGG	3960
50	AGGATTATAA AAATGGCAAA TTTACAAAAG TATATTGAGT ATTCTCGAGA AGTTCAGCAA	4020
	GCACGGGAGA ACAATCAACC GATTGTAGCA TTAGAATCAA CAATTATTTT GCATGGTATG	4080

55

EP 0 786 519 A2

	GCCATTCCAG CAACCATAGC CATTATAGAT GGCAAATTA AAATTGGTTT AGAAAGCGAA	4200
	GATTTAGAAA TACTGGCAAC TAGTAAAGAC GTTGCTAAAG TATCTAGAAG GGATTTAGCA	4260
5	GAAGTTATTG CGATGAAGTG TGTTGGTGCT ACTACTGTAG CGACGACGAT GATATGTGCT	4320
	GCAATGGCTG GTATTCAATT TTTTGTTACA GGAGGTATTG GGGGCGTCCA TAAAGGTGCA	4380
	GAACATACGA TGGACATTTT AGCAGACTTA GAAGAACTGT CTAACAACAA TGTCACTGTT	4440
10	ATCTGTGCAG GTGCCAAATC AATTTTAGAC TTACCTAAGA CGATGGAGTA TTTAGAAACA	4500
	AAAGGCGTTC CAGTTATTGG ATATCAAACG AATGAATTGC CAGCATTCTT CACTCGCGAA	4560
	AGCGGTGTTA AGTTAACAAG TTCGGTTGAA ACGCCAGAAC GACTTGCTGA CATTCAATTA	4620
15	ACAAACAGC AGTTAAATCT TGAAGGTGGC ATTGTTGTTG CTAATCCAAT TCCATATGAG	4680
	CATGCCTTAT CAAAAGCATA TATTGAGGCA ATCATAAATG AAGCTGTTGT TGAAGCGGAA	4740
20	AATCAAGGTA TTAAAGGTAA GGACGCCACA CCGTTCTTGT TAGGGAAAAT TGTAGAAAAA	4800
	ACGAATGGTA AAAGTTTAGC AGCAAATATA AAAGTTGTTG AAAACAATGC GGCGTTGGGT	4860
	GCTAAAATTG CTGTGCTGT TAATAAATTA TTGTAGGTGA TGATACATGA ATATTTTATT	4920
25	CGCTATCACA GGGATAGCAT TTGCACTATT TGTTGCGTTT TTATTCAGTT TTGATCGTAA	4980
	AAAAATAGAC TTCAAAAGA CGTTAATAAT GATATTTATT CAAGTGTGA TCGTGTATT	5040
	TATGATGAAC ACAACGATTG GTTTGACAAT TTTAACTGCA CTAGGTTTAT TTTTGAAGG	5100
30	GCTAATAAAT ATTAGTAAAG CAGGCATAAA TTTTGTTTT GGAGATATAC AAAATAAAAA	5160
	TGGCTTTACG TTCTTTTAA ACGTATTACT GCCATTAGTT TTTATTTCTG TATTAATAGG	5220
	CATCTTTAAT TATATTAAGG TATTACCATT TATTATCAA TATGTAGGTA TCGCTATTAA	5280
35	TAAAATAACT AGAATGGGGC GCTTAGAAAG TTATTTGCT ATTTCAACAG CAATGTTTGG	5340
	GCAACCAGAA GTATATTTAA CAATAAAGA TATTATTCCA AGATTATCTA GAGCGAAATT	5400
	ATATACAATT GCGACGCTG GTATGAGTGC TGTTAGTATG GCAATGCTAG GTTCATATAT	5460
40	GCAGATGATT GAACCCAAGT TCGTAGTTAC AGCAGTAATG TTAAATATTT TTAGTGCGCT	5520
	TATCATCGCC AGTGTAATCA ATCCCTATAA ATCTGATGAT ACTGATGTTG AAATTGATAA	5580
45	CTTAACGAAA TCCACAGAAA CTAAACATT GAATGGAAAA ACAGGAAAAC CTAAGAAAGT	5640
	TGCCITTTTC CAAATGATTG GTGATAGTGC GATGGATGGG TTAAAAATCG CTGTTGTAGT	5700
	AGCCGTAATG TTGTTAGCAT TTATTTTATT AATGGAAGCA ATTAATATCA TGTTTGGTAG	5760
50	TGTTGGTTTG AACTTTAAAC AGCTTATTGG CTATGTGTTT GCACCAATCG CATTCTTAAT	5820
	GGGGATTCCA TGGAGCGAAC TGTTCCAGCT GGCTCTTTAA TGGCGACTAA ATTAATTACA	5880
55		

	CAAGGTATCA TTTCAGTTTA CTTAGTAAGc TTCGCTAATT TTGGTACGGT TGGTATCATC	6000
	GTAGGTTCAA TTAAAGGCAT TAGTGATAAA CAAGGAGAAA AAGTTGCATC CTTTGCAATG	6060
5	AGGTTGCTAC TTGGTTCAAC TCTAGCTTCA ATCATTTCAG GATCAATCAT TGGCTTAGTA	6120
	TTGTAAATGA ATCGAAGTAC CTAAATTAAA TTCATGGCAA AGCTAAACCC CGTCACCAAG	6180
10	TTGGCGCAAC AGCGcATgca TAACTTAGTG ACGGGGTTTT ATCATAACAA TCTACTTTTT	6240
	CGTAGCCGTT TTTGAAATGT ATGTTGATGG TTTATCTTTT TCAAAAATTG TTAATCCCGT	6300
	TATATCTTTT TTATGTTTTG AAGGGACAAT GAAGCTAAGT ATATAAGCAA AGACAAAAGC	6360
15	AACGTGAAAT GAAATGGTAG ATACATAGAA AGGTGAGTTA CCTTTGCCAA CACCATTATA	6420
	GACATAAGCA AAGATGATAC CCAATATTAA TCCACAAATA ACACCGAATG TATTCGTACG	6480
	TTTAGTGAAA ATACCAACTG CAAATACACC AGCCAATGGA ACGCCGAATA ATCCAGTCAC	6540
20	AAACAAGAAT AAATCCCATA AGTCATTGTA ATTAGAAGCA ATTAAGTATA GTGACATTCC	6600
	AAAACCGAAA ATACCTGCAA TGATAATAAT GAAACGTGCA AAGTTAACTT CGTGTGCTC	6660
	GCTACCTTTT CCGAAGAAGC GTTGCTTAAT GTCGATTGAA ATACAAGCAG ATATAGAATT	6720
25	TAACTAGAT GAAATGGTAG ACTGTGCAGC GCGGAAAATG GCTGCAATAA GTAATCCTGC	6780
	TACAAATGGT GGCATCTCAG TCAAATGAA ATATGGCACT ACAGATGATG TATTGAAGCC	6840
	TTTGGTAAA ACAGCTTCAT GTGTATAAAA TGAATACAGC ATTGTACCCA TACCATAAAA	6900
30	TAAAGGTGCT GAAATTAAAG CTAGGATACC ATTTGTCCAT AACGATTAT TTGTTTCTTT	6960
	TAACTATCA GAAGCTTGAT AACGCTGCAC GACGTCTTGA CTCGCTGTGT ATTGATACAA	7020
35	GTGTTGAAA ATATTTCCCTA GGAAAATAAT TGGAAATGGCA GCTGCCGCAG TATTTAGTTT	7080
	CCAATTGTCT GCACTAATTA ATTTTTTGTG CTCAATCGCA TCTGCAAAGA CAGTGCCGAA	7140
	ACCGCCTTTA ATGTTCAAC CACCTAGAAT AATAATAACT AAAGCGCCGC CTAATAAAAT	7200
40	GACGCCTTGA ATGAAATCAC TCCAAACCAC ACCTTCGAAA CCACCTAAAA ATGTATATAA	7260
	AATACATAGT AAACCAACGA GTGATGCAAC GATATAAGGG TTCATGTCTG ATACAGATGT	7320
	GATTGCTAAT GTTGGTAAGT AGATAACAAT TGCAACACGC CCTAAATGGT AAACGACAAA	7380
45	TAATAATGAG CCAATGACAC GTATGCTAGG GCCAAATCTA GCTTCTAAAT ATTCATATGC	7440
	AGATGTTACC TTTAACTTTT TAAAGAAAGG GACATAGAAA TAAATAAGTA ATGGAATAAT	7500
	TGCGACGATA GCAATGTTAC CAGCGATATA TGACCAATCT GTTAAAAATG CTTTCTCTGG	7560
50	TGTCGACATA AATGTAATCG CACTTAACGT AGTAGCATAA ATTGAAAAGC CAACTACCCA	7620
	AGATGGCAAG CGACCACTTG CGGTAAAGAA ACTATTGGTA CTTTGGCTCG CGCGCTTGGT	7680

55

	TGTGCCAAAT CCAACTTCTT TCATGGGCAA CATCCCCTTT ACAATGTATT GATTCTTTGA	7800
	TGTCTATAAA TCGTATTTTG CAATGAGTTG ATCTAATGTT TGTGATGTG CTTCGTTAAA	7860
5	AGGTTTGAAA GGTCTTTTCG GTAATCCTGC ATCAATGCCA CGATGACGTA ATATTTCTTT	7920
	CAATGTTGGA TAAATCCCCA TTGATAACAC TGTTCGATA ATGTCGTTTG AATCATGTTG	7980
	CAGTTGGTAA GCTTCTTGAA TTTGACCTTG TCGTGCTAAG TCGAAGATTT TTCTTGACCG	8040
10	GCGACCATTA ACGTTATATG TAGAACCAAT TGCACCATCT ACGCCAGAAA TCGTAGCTTG	8100
	AACTAACATT TCATCAAAGC CAGATAAGAT TAATTTGTCT GGGAATGCTT TTCTAATACG	8160
	TTCGAGTAGG AAGAAGTTTG GCGCTGTATA TTTAACACCA ACAATTTTTT CATGATTAAA	8220
15	TAGCTCGCTG AATTGTTCAA TAGAAATATT CACACCTGTT AAATCTGTA TTGCATAAAT	8280
	AATCATATTG TTCTGAGTTG CTTCGATAAT ATCGAAATAG TAATCTCTAA TTTCTTCAA	8340
20	AGTAAATGGA TAGTAGAATG GTGTTACGGC AGAAAGTGCA TCATAACCGA GTTCTGTGGC	8400
	ATATTTTCCA AGTTC AATGG CTTCATTTAA ATCTAACGAA CCTACTTGAG CAATCAATTT	8460
	CACTTTATCC CCAACTGCCT CTTTGGCAAC CTTGAAAAC TGTCTCTTCT GCTCTGTATT	8520
25	TAATAAAAAG TTTTCGCCTG AGCTACCATT TACATAAAGA CCGTCTAATT CTTGAGTTTC	8580
	AATGGCATTG TGAGCAATTT GTTTAAGTCC TTGTTCAATT ACTTGACCAT TTTCATCAA	8640
	AGGAACGAGT AACGCTGCAT ATAAACCTTT TAAATCTTTG TTCATTATGA AGTCCCTCCA	8700
30	AAAATCATTT GATAATATAG TTTACAGCTA TAATTGTAAA CGCTATCATA AAATGTAACA	8760
	ATATCTTTTT GAAAATTGTA GTCATATTTA TGTATAATTA ATGAAAATGT TTTTCAAAAT	8820
	CAATAGAAAT GGAGTGAGTA AGGTGTATTA CATCGCAATC GATATTGGAG GCACTCAAAT	8880
35	TAAATCGGCA GTTATTGATA AGCAATTGAA TATGTTTGAC TATCAACAAA TATCAACGCC	8940
	GGACAACAAA AGTGAGCTTA TTAAGTACAA AGTATATGAG ATTGTAACAG GATATATGAA	9000
40	GCAATATCAG TTGATCCAAC CTGTCATAGG TATTTTCATCA GCAGGCGTTG TTGATGAACA	9060
	AAAAGGCGAA ATTGTATACG CAGGGCCAAC CATTCCGAAT TATAAAGGTA CTAATTTTAA	9120
	GCGATTATTA AAATCACTGT CTCCTTATGT CAAAGTAAAA AATGATGTAA ACGCTGCATT	9180
45	ACTAGGCGAA TTGAAATTAC ATCAATATCA AGCAGAACGG ATCTTTTGTA TGACGCTTGG	9240
	TACAGGCATT GGGGGTGCCT ACAAGAATAA TCAAGGTCAT ATTGATAATG GTGAGCTTCA	9300
	TAAGGCAAAT GAAGTTGGGT ATTTATTGTA TCGTCCAAC TAAATATCAA CGTTTGAGCA	9360
50	ACGTGCTGCA ACGAGTGCAT TGA AAAAGCG CATGATTGCC GGAGGATTTA CGAGAAGCAC	9420
	ACATGTGCCA GTATTGTTTG AAGCAGCTGA AGAAGGTGAT GATATTGCAA AACAAATATT	9480

55

	AGGGCTTATA TTAATTGGGG GCGGTATATC TGAACAAGGA GATAATCTCA TTAAATATAT	9600
5	CGAGCCGAAA GTTGACACT ATTTACCAA AGACTATGTT TATGCACCAA TACAAACGAC	9660
	TAAGAGTAAA AATGATGCAG CATTATATGG CTGTTTGCAA TGATAGTTGA AAGAAGGAGT	9720
	CATTCTAAAA TAGAATTGTA AACCGTTACG AGAGATGAGA GCTGTTGTTA GTTCCACACA	9780
10	TCACACTCTA TCTAGGACCA ATCTAAACTA TATCAACCAA CAGTGTGCCA CGGGCAAATT	9840
	AAATTGAAGA AGCTGAGATA TTAAATTTT AGAAAATGTA AAAAAATATT TGGTATTGAA	9900
	ATTAAAAAG CACCTAGCAA CTCGTGGGA CAATCACGAT GATTGTCTAC AGTTGCAGGT	9960
15	GGATTTGAAT ATACTACTAG TTATTGTTG TCTAGGATAA TAGATTTAGT ATGTTGATAA	10020
	GTTTGACTCA GATTTCGTATT TTCTAATAAA TGATAACTCA CGATATCGAT TAAAAAGAGT	10080
	GTGCAATTT GTGTGTTGAT AAATTGATGG TCGGTATTAC GCGATTGATC CGTTGTTAAA	10140
20	AGTACTAAAT CTGCACAATC TGTAAGTTTA CTACCTTCAA AATTTGTGAT GGCAACGACA	10200
	TATGCACCAT GAGATTGGC GACTTCCGCT GCAGAAATTA ATTCCGAAGT ATTACCACTA	10260
	TTTGACATAG CAATAACAT ATCCGAATGA GATAGTAGGG ATGCCGATAT TTTCAATAA	10320
25	TGTGAATCGG TAGTAACATT ACCTTTTAGC CCCATACGAA TCATACGATA ATAAAATTCA	10380
	GTGCGTGATA AACCAGAGCT ACCTAGTCCA GCAAAGAGTA TATGTCGACT TGATTGAAGT	10440
	TTGTCGATAA AGGTTTGAT AATGTCGTTA TCAATAAATT CACCAGTTTG TTGAATGATT	10500
30	TGTTGATGAT ATTTATGAAT TCTTTGAATA ATTGGGCTAT TTTCAATAAC TGTCTCTGTC	10560
	ATTTCTTGTT GAATATTAAA TTTTAAATCT TGGAAATTCT CATAATCCAG CTTATGACTA	10620
	AAGCGTGTCA TCGTTGCTGG TGATGTACCA ATCGCATGGG CTAAGGAGTT AATCGTTGAA	10680
35	AAGGCATCGC TATAACCATT TTGTCTTATA TAATTGACGA TCGGTTTATC AGTTTTTGTA	10740
	AATAAATGTT GATAACGTTG AACACGATTC TCAAATTCA TTGTGTCACC CCTTCATCTT	10800
40	AATGATTACT ATTATATATG AAAAAATTTT TCAAGATAGT AAAAAGCATT GATAAAAATT	10860
	ATCTTAATGA TATATTGTAA ATGACTTTAC GTGAAAAAC GACTTATGGA GTGAGGAATA	10920
	ATGTTACCAC ATGGATTAAT AGTATCTTGT CAGGCACTAC CAGATGAACC ATTGCATTCA	10980
45	TCTTTTATTA TGTCGAAAAT GGCATTAGCT GCGTATGAAG GTGGTGCTGT TGGTATTCGC	11040
	GCAATACTA AGGAAGACAT TTTAGCAATT AAAGAAACGG TAGATTTACC AGTTATTGGC	11100
	ATTGTGAAAC GTGACTATGA TCACTCAGAT GTTTTCATTA CTGCAACGTC AAAAGAAGTT	11160
50	GATGAACTGA TAGAAAGCCA ATGTGAAGTC ATTGCATTGG ATGCAACGTT ACAGCAACGT	11220
	CCGAAAGAAA CGTTAGACGA ATTAGTATCA TATATTAGAA CACATGCACC GAACGTTGAA	11280

55

EP 0 786 519 A2

TATATTGGCA CGACGTTACA TGGCTATACT AGTTATACGC AAGGACAATT ACTTTATCAA 11400
 AATGACTTCC AATTTTTTAAA AGATGTACTA CAAAGTGTG ATGCAAAAGT TATTGCGGAA 11460
 5 GGTAATGTCA TTACACCGGA TATGTATAAA CGTGTGATGG ACTTAGGCGT TCATTGTTCA 11520
 GTCGTTGGTG GTGCGATAAC ACGACCAAAA GAAATTACGA AACGTTTTGT TCAAATTATG 11580
 GAAGATTAAA TGATAACGAT AAAAAACGA GATGACCATC ATTAATTAAA GGCACCTAAT 11640
 10 TATCTTAGGT GGCTGAATGA ATGTAATGGG TTCATCTCGT TTTGTTTGT TATGATAGTG 11700
 ATTTTATTTT CAACTTTATC CAAAAATAAG TAAAGCGACG GGGATGGTGA TTAATAGCGA 11760
 CAACGCCACG CGTAAAAACC AAATGATGAT GAGTTTCCAG ACAGGTATTT TAATTTCACT 11820
 15 TGCTAGTATA CATGGCACTA ATGCTGAGAA AAAGATAATG GCTGATACGC TTAATACACC 11880
 GACGACAAAT TTAGTACTCA TTGCAGCTTT AGTTACTAAC AAAGATGGTA GAAACATCTC 11940
 TACAATAGAA AACTCTGACG TTTTGCTAGT AAAGCCTGAT CAGCAATTGG GAAAATATAA 12000
 20 ATAAATGGAT AGAAGATATA GCCAAGCCAA TCAATGAATG GTGTATAGTT CGCTACAATC 12060
 AGTCCTAAAA AACCAATCGA TAATATAGAA GGTAAAATAC CAACAGTCAT TTCTAAACCG 12120
 25 TCTTTCAAT TGTCCCAAAC GTTCTTCACG AGAGATGGTG TTAATGCATT TTGTTTCATC 12180
 GCCTCTGCAT ATGCAGTTTT CAGTCTGCTT CCTTCAATAG CAACTTCTTG TTCTCCTTCT 12240
 TGTCCGTTAT AATATTCTGT TGATTCAATG CTGATTGGCG GTAGCCATGC AGTAATTGCA 12300
 30 GTCACGACAA ATGTGATGAC TAAAGTTATC CAAAAGTATA AATTCCAATG CGGCATTAAT 12360
 CCTAAAGTTT TAGCAACGAT AATCATAAAA GTTGCTGAAA CTGTTGAAAA GCCAGTCGCA 12420
 ATAATCGTGG CTTCTCGTTT GTTGACATC CCTTGCTTAT AGACACGATT AGTAATCAAT 12480
 35 AATCCTAAGG AATAACTGCC GACAAACGAA GCCACTGCAT CGACAGCGGA TTTTCCTGGT 12540
 GTTTTAAAAA TAGGTCTCAT AATAGGCTCC ATATAAACAC CGACAAATTC TAATAAGCCA 12600
 TAGCCCACTA ATAAAGAAAG CGCAATTGCA CCTACTGGAA TTAAGATACT TAATGGCATC 12660
 40 ATTAATTTTT CAAACAAAAA CGGACCATAG TTAGCTTTAA ATAGTATTGA TGGACCGATT 12720
 TTAAATACAT ACATTATACC GATCATTGCA CCTGCAACTT TAAATAATGT AATGACCAAG 12780
 TTTGTGATTG AAGTCATAAA AGTACGTCTC ACTATTGGTA ACGCTGTACC AATTAAAATC 12840
 45 ATAATCAGTG CAACATAGGG CATAAGTGGA CCTATGATTG AGCGAATGGC TAGATGAACA 12900
 TGATCGACGA AAATAGTGTT GTTACCATTA ATCGTAAAAG GAATAAAGAA ACATAGTATG 12960
 50 CCCACTAAAC TATAGACAAA AAAACGCCAT GCACTTGGTT GTTGTGCATT AGAATGATAT 13020
 TGATTCATTA AAGCAACCCC TTTGTTTAAA TGAATACACA AACTGTATG ATGCATCTTC 13080

55

EP 0 786 519 A2

	ATAGTTTGAA TTATTTTCAT ACCAATACAA ATTAAC TAAT TATATATAGA TTGAACTAT	13200
	ATTACTTAAT AAAATATTTA TCTTAAATGT TGTGTGTGTG ATTCAACACC ACAACTAAAA	13260
5	GTGTTTATAA ATTATTTGGA AATACACATA TTTGTAAATG ATTAGTATCG ATTTAATATC	13320
	GTATTATTAA ATTTTATTAA ATTTTGTAGT CTTAATCMAA AAATAATATA TGTCAATGTA	13380
	TATTGAAGGT GCAGTTGTTT TTCATTCTCA AGAGGGGGTC AAAAAAATAC TTTTGAGGTG	13440
10	ATTATATGTT AAGAGGACAA GAAGAAAGAA AGTATAGTAT TAGAAAGTAT TCAATAGGCG	13500
	TGGTGTCACT GTTAGCGGCT ACAATGTTTG TTGTGTCATC ACATGAAGCA CAAGCCTCGG	13560
	AAAAACATC AACTAATGCA GCGGCACAAA AAGAAACACT AAATCAACCG GGAGAACAAG	13620
15	GGAATGCGAT AACGTCACAT CAAATGCAGT CAGGAAAGCA ATTAGACGAT ATGCATAAAG	13680
	AGAATGGTAA AAGTGAACA GTGACAGAAG GTAAAGATAC GCTTCAATCA TCGAAGCATC	13740
	AATCAACACA AAATAGTAAA ACAATCAGAA CGCAAATGA TAATCAAGTA AAGCAAGATT	13800
20	CTGAACGACA AGGTTCTAAA CAGTCACACC AAAATAATGC GACTAATAAT ACTGAACGTC	13860
	AAAATGATCA GGTTCAAAAT ACCCATCATG CTGAACGTAA TGGATCACAA TCGACAACGT	13920
25	CACAATCGAA TGATGTTGAT AAATCACAAC CATCCATTCC GGCACAAAAG GTAATACCCA	13980
	ATCATGATAA AGCAGCACCA ACTTCAACTA CACCCCCGTC TAATGATAAA ACTGCACCTA	14040
	AATCAACAAA AGCACAAGAT GCAACCACGG ACAACATCC AAATCAACAA GATACACATC	14100
30	AACCTGCGCA TCAAATCATA GATGCAAAGC AAGATGATAC TGTTCGCCAA AGTGAACAGA	14160
	AACCACAAGT TGGCGATTAA AGTAAACATA TCGATGGTCA AAATTCCCCA GAGAAACCGA	14220
	CAGATAAAAA TACTGATAAT AAACAACATA TCAAAGATGC GCTTCAAGCG CCTAAACAC	14280
35	GTTGACTAC AAATGCAGCA GCAGATGCTA AAAAGGTTTC ACCACTTAAA GCGAATCAAG	14340
	TACAACCACT TAACAAATAT CCAGTTGTTT TTGTACATGG ATTTTITAGGA TTAGTAGGCG	14400
	ATAATGCACC TGCTTTATAT CCAAATTATT GGGGTGGAAA TAAATTTAAA GTTATCGAAG	14460
40	AATTGAGAAA GCAAGGCTAT AATGTACATC AAGCAAGTGT AAGTGCATTT GGTAGTAACT	14520
	ATGATCGCGC TGTAGAACTT TATTATTACA TTAAAGGTGG TCGCGTAGAT TATGCGCGAG	14580
	CACATGCAGC TAAATACGGA CATGAGCGCT ATGGTAAGAC TTATAAAGGA ATCATGCCTA	14640
45	ATTGGAACC TGGTAAAAAG GTACATCTTG TAGGGCATAG TATGGGTGGT CAAACAATTC	14700
	GTTAATGGA AGAGTTTITA AGAAATGGTA ACAAGAAGA AATTGCCTAT CATAAAGCGC	14760
50	ATGGTGGAGA AATATACCA TTATTCATG GTGGTCATAA CAATATGGTT GCATCAATCA	14820
	CAACATTAGC AACACCACAT AATGGTTCAC AAGCAGCTGA TAAGTTTGA AATACAGAAG	14880

55

	ATTTAGGATT AACGCAATGG GGCTTTAAAC AATTACCAAA TGAGAGTTAC ATTGACTATA	15000
	TAAAACGCGT TAGTAAAAGC AAAATTTGGA CATCAGACGA CAATGCTGCC TATGATTAA	15060
5	CGTTAGATGG CTCTGCAAAA TTGAACAACA TGACAAGTAT GAATCCTAAT ATTACGTATA	15120
	CGACTTATAC AGGTGTATCA TCTCATACTG GTCCATTAGG TTATGAAAAT CCTGATTAG	15180
10	GTACATTTTT CTTAATGGCT ACAACGAGTA GAATTATTGG TCATGATGCA AGAGAAGAAT	15240
	GGCGTAAAAA TGATGGTGTC GTACCAGTGA TTTCGTCATT ACATCCGTCC AATCAACCAT	15300
	TTGTTAATGT TACGAATGAT GAACCTGCCA CACGCAGAGG TATCTGGCAA GTTAAACCAA	15360
15	TCATACAAGG ATGGGATCAT GTCGATTTTA TCGGTGTGGA CTTCTGGAT TTCAAACGTA	15420
	AAGGTGCAGA ACTTGCCAAC TTCTATACAG GTATTATAAA TGACTTGTTG CGTGTGGAAG	15480
	CGACTGAAAG TAAAGGAACA CAATTGAAAG CAAGTTAAAT TCATCTTCTG AATTTAATAT	15540
20	GCTATGTAAA TCGTGCTGTT ATCATGGCAC ATCAGATATA AGTAGCATCA CAGTGTGAA	15600
	TTTAAAAATA GTAAAGTGAA ATAAAGCGCC TGTCTCATT GCGAAAATA AAGGGACAGG	15660
	CGTATCTGTT TATGAGCTTA ATAAATTGTA TGAATAATAT GGTTGATCGA ATAACGTTT	15720
25	ATCATGATGA TAAATTGAGT TTTTAAAT AATGATATAT TACATCATTG TTATAGCGTT	15780
	TAAGAAATCA ACAACTTTAC GATAAATAGT GATTGCTTCG TCATTAGGTC TACGATCAAA	15840
	ATCATGCTCG TTTTATTCA CGCGTTCAAA TGTGAATGT GGAACATGAT TCATGATATG	15900
30	TTGCGTTTCC TCAACGGGAA CATCATAATC GCCATTACAA TCGCAATGA AAACAGGTGG	15960
	AAGTGTTTTA AGTTCATCTG GTGCAATATT ATATTTTGAA TTAGTATAAT CAGCAATGTT	16020
	AATCATATTT ATCCATTTAC CTGTGCCACG TGCATAACG TAGATTAAAA AACGTTGTGC	16080
35	GATTTGATCT TGAACAACCG GTGTTGGTGA AGTGAGTTGT GCAATCATTG TTTCGTTTAC	16140
	GCTTTGAGCT ATTTTTCGCT AATAACTATT AGTTGTTTTA AAAGGTTTCAG TGTTGATGCG	16200
40	ACTATAACCA TAAAAATCAA TAACACCATC AATATCTCTG TCTCGTGCAA TTAATAGACT	16260
	TAAATATGCA CCTGATGATC TGCCAAAGGT AAAAATAGGG CAATTAGAAT ATTGTGATTG	16320
	AATCGCATCG AATGAtGCgn AGnACATCCT CAATAATGCA ATCGAGACTT ACTTCTGGTA	16380
45	ATAAACGATA ACTTAGTTGA ATTAAATCGT AATGTTCCGT AAgATATCGA TATACTGTGG	16440
	GGATAAATCG TTAGCTTTAC CGAACATTAA TCCACCACCG TGGATGTAGA CAATAGCGCC	16500
	TTTTGTGGT TGATTTTTTG CTTTAATAAT TGTGTAAGGT AATGCAAATG CATCTTTAGT	16560
50	AATTACTTTA TCTTTAATTT CAGTCACGAT TTAATAGGCT CCTTATTTTT GATATTGATG	16620
	TCATTATAAC ACTGTCTTAA ATTTCCATGA AAAATAGTCT TAAGACGATG AGTCATGATA	16680

55

EP 0 786 519 A2

	CATCATTTTA	ACAAATATCTT	TAAAAGCAGC	ATGTGGAATG	GCTAAATCTT	CTAAATCTGC	16800
	CATAGAAAAT	TCAAGATTGA	TATCATGTGG	TCGCTGTTCA	GCAAGTTTAT	GCACAAAGTC	16860
5	AGGTTCTGTG	ACAAAAGGCG	AAGACATGCC	GACCATATCT	GCATGTTGTA	AAGCATCTAA	16920
	AGCAGACTCT	GGAGAATTAA	TCCCGCCACT	TGCAATTAAA	GGGATACGAC	CTGCTAAATG	16980
10	TTCATAGACA	ATTGGTTAA	CTGGTCGACC	GAAATGATCA	CCTGGTGTA	GAGACGTATT	17040
	TTGATAAATA	TGTCGACCCC	AGCTAGCGAT	TGCTAAGTAT	TGGATGTTTG	AAACGTCCAT	17100
	GACCCAATTG	ATTAATTGGT	TGAAGTCGTC	AATGGTATAT	CCTAAATCAC	TGCCTCTGGT	17160
15	TTCTTCTGGC	GTTGCTCGAA	ATCCTAAAAT	AAAATTGTCA	GGTGCTTCTT	TATCAATCAC	17220
	TTCTTGTA	GCACGCATAA	CTTCTAAACA	TAATCTTGCA	CGATTTTTTA	ATGAGTCGGC	17280
	ACCGTAATGG	TCTGTACGTT	TATTCGAAAA	AGTTGAGAAA	AATGTTTGAA	TCAGCAAACG	17340
20	TTGTGCAATC	GAAATTTCCA	CACCATCAAA	ACCTGCTTTA	ATCGCGCGTA	ATGTAGCATC	17400
	GCGATACTGC	TGAATGATGC	TATTGATTTT	CTCATGAGAC	ATGGCGATAA	CATCGTGTTT	17460
	AATCGGTGAA	TGCAATGTCA	TAGGGCTTGG	TCCATACACC	TTCCAAAAT	TTAAAATGGC	17520
25	TTGATTGAA	AAACGACCAG	CATGCGCTAG	CTGGATAATA	GCGAGGCTAC	CATGTTGTTT	17580
	CATCGTAGAT	GCCATGTTAG	TTAATCCAGG	GATACAAGCA	TCATGATCAA	TATTAAAGCC	17640
	ATATTCAAAC	AATTGACCAT	AAGGTTCAAT	GTAAGCAGCG	CCGGTGACTT	GCATTCCAGC	17700
30	TGAATTAGAG	CGACGTGCAG	CATAAGCCAA	GTCTTCTTTT	GTAATATAGC	CTTCTTTTGT	17760
	TGATGTGTTT	ACGGTCATTG	GTGATAATAC	AAAGCGATTC	GAAATTTTGA	TGCCATTAGG	17820
	TAAGTGGATT	GATTGTAAAA	GTGGTTTGTA	TCGGTACATA	CTATGATTCC	TTTTCTATT	17880
35	AATATTGTTT	TCAAAGTACC	ATGGAAAGAA	TGAATAATCA	ATGATGAACA	GTCTTGATAG	17940
	AATAGAATTG	GTACATGGAA	AGTATTTTTA	AAATTAAACT	AATGAATGGC	ATTTGTAGGT	18000
40	CTGAAAATAT	GAATATGAAA	AAGAAAAATA	AAGGCGAAAA	GATATAAAAG	TTAATTGAAA	18060
	AACGTTATCA	TATACGTGGG	TATATGAAGA	GGGAATGGTA	TTAAGAACGC	TAAAATGTTA	18120
	TGTCGGTTTG	ACATGACAGG	ATAAGTTTGG	AGATGACGGA	TTGGTTAAAT	TAAGCGTATT	18180
45	AGACTATGCC	TTAATAGATG	AAGGTAAGGA	TGCACAAAAG	GCATTGCAAG	ATTCAGTGAC	18240
	ACTTGCAAAA	TTAGCAGATC	GACTTGGCTT	TAAGCGAATT	TGGTTTACGG	AACATCATAA	18300
	TGTACCAGCG	TTTGCGTGTA	GTAAGTCCAGA	ACTTTTGATG	ATGCATACAT	TGGCGCAGAC	18360
50	AAATCACATA	CGAGTTGGCT	CTGGTGGTGT	GATGCTGCCG	CACTATCGAC	CTTATAAAAT	18420
	TGCTGAGCAT	TTTAGAATGA	TGGCAGCGTT	ATATCCAAAT	CGTATTGATT	TAGGTATTGG	18480

55

EP 0 786 519 A2

	TAGTTACGAT GAATCGATT CGTTATTACG TGATTATCTT ACAATAAAGG ATAAACCAAG	18600
	TGCGCATACG TTAGGTGTCC AACCACACAT TGATCATTTT CCAGAAATGT GGTATTAAAG	18660
5	TAGTAGCGCA ACATCTGCCA AAATAGCTGC CGAACTAGGT ATAGGGCTTT CTGTTGGAAC	18720
	ATTTTTGCTA CCAGATATAA ATGCGATACA TACAGCGAAG GATAACATTG ATATTTACAA	18780
	AAAACATTTT CAAGCATCAA CGATTAAAAT GGACGCAAAG GTGATGGCAT CTGTATTTGT	18840
10	CATTGTAGCT GATAACGAAG CGGAAGTAGC AGCATTACAA CATGCCTTAG ATGTTTGTTT	18900
	ATTAGGTAAA TTACAATTG CAGAATTTGA AGATTTTCCT TCAGTAGACA CAGCACAAAA	18960
	GTATAAGCTT AATGATCGAG ACAAAGAGAT GATTCAAGCA CATCAAGCAC GCATCATTGC	19020
15	AGGTACACAA GAAAAGGTTA AAGCACAATT AGATGATTTC ATTGCTACGT TTGAAGTTGA	19080
	TGAGGTGTTA GTAGCACC GC TTATTCCAGG TATTGAACAG CGTTGTAAAA CATTAAAATT	19140
20	ACTCGCGGAA ATTTATTTGT AGCATTTTAA ATAGAAGAGA AAGGATGAAG ATAAGATGAA	19200
	AAAGTTAGCC AATTATTTAT GGGTAGAAAA AGTAGGAGAT TTGTATGTGT TTAGTATGAC	19260
	ACCTGAATTG CAAGATGATA TTGGGACAGT AGGTTATGTT GAATTCGTAA GTCCAGATGA	19320
25	AGTTAAAGTG GATGATGAAA TTGTGAGTAT CGAAGCATCG AAAACGGTCA TTGATGTGCA	19380
	AACGCCATTG TCAGGAACGA TTATTGAGCG AAATACAAAA GCGGAAGAAG AACCGACAAT	19440
	TTTAAACTCT GAAAAACCAG AAGAAAATTG GTTGTTCAAA TTGGATGATG TCGATAAAGA	19500
30	AGCATTCCTA GCATTACCGG AGGCTTAAAT GGAAACGTTA AAATCAAATA AAGCGAGACT	19560
	TGAATATTTA ATCAATGATA TGCATCGAGA GAGAAATGAC AATGACGTAT TGGTAATGCC	19620
	ATCTTCATTT GAAGATTTGT GGGAAATTATA TCGAGGCTTA GCAAATGTCA GACCGGCATT	19680
35	ACCTGTAAGT GATGAATATT TAGCTGTACA AGATGCTATG TTAAGTGATT TGAATCGTCA	19740
	ACATGTTACG GATTGAAGG ATTTGAAGCC GATAAAAGGT GACAATATCT TTGTTTGGCA	19800
	AGGTGATATC ACGACGTTAA AAATCGATGC TATTGTTAAT GCTGCAAATA GTCGTTTTCT	19860
40	AGGATGTATG CAAGCTAATC ATGACTGCAT TGATAATATT ATTCATACAA AAGCGGGTGT	19920
	TCAAGTTCGA CTTGATTGTG CAGAGATCAT TCGACAACAA GGGCGCAATG AAGGTGTAGG	19980
45	TAAAGCCAAA ATAACACGTG GATATAATTT GCCAGCAAAG TATATAATTC ATACGGTTGG	20040
	TCCGCAAATA CGTCGATTGC CTGTTTCAA GATGAATCAG GACTTGTTAG CTAAATGTTA	20100
	TCTTAGCTGT CTTAAATTGG CTGATCAACA TAGTTTAAAT CATGTCGCTT TTTGCTGTAT	20160
50	ATCTACAGGT GTATTTGCTT TTCCTCAAGA TGAAGCAGCA GAAATTGCTG TTCGAACAGT	20220
	AGAAAGCTAT CTCAAAGAAA CAAATTCAAC ATTGAAAGTC GTGTTCAATG TATTTACAGA	20280

55

EP 0 786 519 A2

	CAATGTCTCT GTTAATGGAT GACAAGACAA AGCAGGCTGA AGTATTGCGT ACTGCGATTG	20400
	ATGAAGCAGA TGCATAGTG ATTGGAATTG GTGCAGGCAT GTCTGCATCT GACGGATTTA	20460
5	CATATGTAGG AGAGCGTTTT ACGGAAAATT TCCCAGATT TATTGAAAAA TATCGCTTCT	20520
	TTGATATGTT GCAAGCGAGT TTACATCCTT ATGGCAGTTG GCAAGAGTAT TGGGCATTTG	20580
	AGAGTCGTTT TATTACATTA AACTATTTAG ATCAACCTGT AGGTCAGTCT TACCTCGCTT	20640
10	TAAAATCCTT GGTGGAAGGT AAACAGTACC ACATTATAAC TACGAATGCA GATAATGCTT	20700
	TCGATGTAGC TGATTATGAT ATGACTCATG TATTTTCATAT ACAAGGGGAG TATATACTGC	20760
15	AACAGTGTAG CTCAGCATTG TCATGCTCAA ACGTATCGCA ATGATGATTT AATTCGTAAA	20820
	ATGGTTGTTG CGCAACAAGA TATGCTTATA CCTTGGGAGA TGATTCCAAG ATGTCCAAAA	20880
	TGTGATGCCC CAATGGAAGT GAATAAACGT AAAGCGGAAG TTGGGATGGT TGAAGATGCT	20940
20	GAATTTTCATG CGCAACTACA TCGTTATAAT GCTTTTCTAG AGCAACATCA AGATGATAAA	21000
	GTGTTGTATT TGGAAATTGG AATTGGTTAT ACTACACCAC AATTTGTGAA GCATCCTTTT	21060
	CAGCGTATGA CACGTAAAAA TGAAAAAGCC CTTTATATGA CGATGAATAA AAAGGCATAT	21120
25	CGCATTCCGA ATTCAATTCA AGAACGTACC ATACATTTAA CTGAGGATAT CTCAACATTG	21180
	ATTACAGCAG CACTCCGGAA CGACAGCACA ACGAAAAATA ACAACATTGG AGAGACAGAA	21240
	GATGTACTTA ATAGAACCGA TTAGAAATGG AGAATATATT ACTGATGGTG CGATTGCACT	21300
30	CGCTATGCAA GTTTATGTTA ACCAGCATAT CTTTTTAGAT GAAGATATTT TATTCCTTA	21360
	TTATTGTGAT CCAAAGTGG AAATTGGACG TTTTCAAAAT ACTGCTATAG AAGTGAATCA	21420
	AGATTATATA GATAAACACA GTATTCAAGT AGTTCGCCGA GATACTGGTG GTGGCGCTGT	21480
35	GTATGTTGAT AAAGGTGCCG TTAATATGTG TTGTATTTTA GAACAAGACA CTTCAATTTA	21540
	TGGTGATTTT CAACGATTTT ATCAACCAGC TATAAAGGCG TTGCATACAT TAGGTGCAAC	21600
	AGATGTGGTA CAAAGCGGTA GAAATGATTT AACATTGAAT GGTAAAAAAG TGTCAAGCGC	21660
40	CGCAATGACA TTAATGAATA ATCGTATTTA TGGCGGTTAT TCGCTATTAC TTGATGTTAA	21720
	TTATGAAGCA ATGGATAAAG TGTAAAGCC TAATCGCAA AAGATTGCAT CGAAAGGGAT	21780
45	TAAATCTGTG CGCGCACGTG TTGGTCATCT TAGAGAAGCA CTGGATGAAA AGTATCGTGA	21840
	TATAACCATT GAAGAATTTA AAAATTTAAT GGTGACGCAG ATTTTGGGAA TCGATGACAT	21900
	TAAAGAGGCG AAACGATATG AATTAACGGA TGCAGATTGG GAAGCGATTG ATGAATTAGC	21960
50	TGATAAAAAG TATAAAAATT GGGATTGGAA TTATGGCAAG TCACCCAAAT ATGAATACAA	22020
	TCGAAGTGAA AGATTATCTT CAGGTACGGT AGACATAACA ATTTCTGTTG AACAAAATCG	22080

55

5 AGAAGCATTa CAAGGAACAA AAATGACAAG AGAAGATTTA ACGCATCAGT TAAAGCAATT 22200
 AGACATCGTT TATTATTTTG GCAATGTTAC GGTAGAAGCA TTAGTGGATA TGATTTTAAG 22260
 10 TTAATATTGT TATTTTATGT ATGCTGAATC ATTGGAAGTG TTTGCTTGCT CTTGAAAAGG 22320
 TGACAATAGT GTTTGGTGAA GGTGAACAT ATGAGTGGAA ATTATTGCCT TTAACATTC 22380
 AAAGTATGAT ATATATATGG TTTTGTTC TAAATGATTG GGTATTTGAA AATAGATGAG 22440
 15 TTTAATATTT TAAGGAATAT AATGATGTTT ACTTTTATAA TTCATATAGA ATATTAAGCA 22500
 ATATAAGTCT GTTGATATAT ACAAATATA ATGACTGCTA TAATGAGTAA TCAATAGACA 22560
 CAAAGAGGAG ATTATGTGAT GAATAATAAA GTATTAGTAA CCGGTGGTAC AGGGTTTGTT 22620
 20 GGCATGCGAA TTATTTACAG ATTATTAGAA CAAGGTTATG ACGTACAAAC GACGATACGT 22680
 GATTTAAGTA AAGCTGATAA AGTAATTAAC ACAATGCAAG ACAATGGCAT TTCCACAGAG 22740
 CGATTAATGT TTGTCGAAGC GGATTTATCA CAAGATGAAC ATTGGGATGA AGCAATGAAA 22800
 GATTGCAAGT ATGTCTTGAG TGTAGCATCT CCGGTGTTTT TCGGTAAAAC AGACGATGCA 22860
 GAAGTGATGG CGAACTGcAA TTGAAGGTAT ACAACGTATT TTAAGAGCTG CAGAACATGC 22920
 25 GGGTGTTAAA CGTGTGGTAA TGACTGCAAA CTTTGGTGCA GTTGTTTGA GTAATAAAGA 22980
 TAAAAATTCA ATCACAATG AAAGTCATTG GACAAATGAA GATGAACCAG GCTTATCAGT 23040
 ATATGAAAAA TCAAAATTGT TAGCTGAAAA GGCAGCGTGG GATTTTGTTG AGAATGAAAA 23100
 30 TACAACAGTA GAATTTGCCA CAATCAATCC AGTTGCAATT TTTGGGCCAT CATTAGATGC 23160
 ACACGTTTCA GGAAGCTTTC ATTTATTAGA AAATTTATTG AATGGTTCAA TGAAACGTGT 23220
 ACCGCAAATT CCGTTAAATG TTGTTGATGT GAGAGACGTA GCTGAACTGC ACATTTTGGC 23280
 35 AATGACAAAT GAACAAGCTA ATGGCAAGCG ATTTATTGCG ACGGCTGATG GACmATTWA 23340
 tTTGTTGGGA ATTGcCAAAt TAATTAAAGA AAAGGGCCTG GAAATAGCTC CAAAAGTTCC 23400
 40 TACTAAAAAA TTACCCAGCT TTATTTTGAG CnAnGnGCC 23439

(2) INFORMATION FOR SEQ ID NO: 39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4522 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 39:

CCCTTTGAGA GTATATCATC TAGTCAAATT ATGCCTGTCA TTAGAGCGAC TAGCTTTGAT 60

	TATTATGCAG TCGATTTAGG GAAATCATAT CGTCTAATTG ACGAAAGCAT GTTAGAGGAT	180
	TTGAAGTTAA CTGAACAACA AATAAGAGAA ATGTCTCTGT TTAATGTTAG AAAATTGTCA	240
5	AATTCATATA CGACTGATGA AGTAAAAGGT AATATTTTTT ATTTTATTAA CTCAAATGAC	300
	GGGTATGATG CAAGTAGGAT ACTAAATACT GCATTTTTTAA ATGAAATTGA GGCACAATGT	360
	CAAGGCGAAA TGCTCGTAGC AGTGCCACAC CAAGATGTGT TAATTATTGC AGATATACGC	420
10	AATAAACAG GATATGATGT GATGGCACAT TTAACAATGG AATTTTTCAC TAAAGGTCTA	480
	GTTCCAATTA CATCATTATC CTTTGGATAT AAACAGGGTC ATCTTGAACC GATATTTATT	540
	TTAGGTAAAA ATAATAAACA AAAAAGAGAT CCAAACGTGA TTCAGCGTTT AGAAGCAAAT	600
15	CGTCGTAAAT TTAATAAAGA TAAATAGAAA TAATTGGATA AGGAGTTTGT TCATAATGAA	660
	TTTATTTTAC AATCCTAAAT ATGTAGGAGA TGTCGCATTT TTACAAATTG AACCAGTTGA	720
20	AGGTGAATTA AACTACAATA AAAAAGGTAA TGTGTGTGAA ATTACTAATG AAGGTAATGT	780
	TGTAGGTTAT AATATTTTTG AAATTTCAAA AGATATAACA ATTGAAGAAA AAGGTCATAT	840
	TAAATTAATCT GATGAACTTG TAAATGTATT CCAAAGCGT ATTTCAGAAG CTGGTTTTGA	900
25	TTATAAATTA AATGCTGATC TATCACCGAA ATTTGTAGTT GGCTACGTTG AAATAAAGA	960
	CAACATCCT GATGCAGATA AATTAAGTGT ACTAAATGTA AACGTTGGAA ATGACACATT	1020
	ACAAATTGTA TGTGGCGCGC CTAACGTTGA AGCTGGACAG AAAGTTGTTG TTGCTAAAGT	1080
30	AGGTGCAGTG ATGCCTAGCG GTATGGTAAT TAAAGATGCT GAATTACGTG GTGTTGCCTC	1140
	AAGCGGTATG ATTTGTTCAA TGAAAGAATT GAATTTACCT AATGCACCTG AAGAAAAAGG	1200
	TATTATGGTA TTAAATGACA GCTATGAAAT TGGACAAGCA TTCTTTGAAT AATTAAGGAA	1260
35	GGTAGTGAAA ATATGAGCTG GTTTGATAAA TTATTCGGCG AAGATAATGA TTCAAATGAT	1320
	GACTTGATTG ATAGAAAGAA AAAAAGACGT CAAGAATCAC AAAATATAGA TACGATCAT	1380
	GACTCATTAC TGCCTCAAAA TAATGATATT TATAGTCGTC CGAGGGGAAA ATTCCGTTTT	1440
40	CCTATGAGCG TAGCTTATGA AAATGAAAAT GTTGAACAAT CTGCAGATAC TATTTAGAT	1500
	GAAAAAGAAC AATACCATCG AGACTATCGC AAACAAAGCC ACGATTCTCG TTCACAAAAA	1560
45	CGACATCGCC GTAGAAGAAA TCAAACAAC TGAAGAACAA ATTATAGTGA ACAACGTGGG	1620
	AATTCTAAAA TATCACAGCA AAGTATAAAA TATAAAGATC ATTCACATTA CCATACGAAT	1680
	AAGCCAGGTA CATATGTTTC TGCAATTAAT GGTATTGAGA AGGAAACGCA CAAGCCAAAA	1740
50	ACACATAATA TGTATTCTAA TAATACAAAT CATCGTGCTA AAGATTCAAC TCCAGATTAT	1800
	CACAAAGAAA GTTCAAGAC TTCAGAGGTA CCGTCAGCTA TTTTGGCAC AATGAAACCT	1860

55

EP 0 786 519 A2

	AAACAAAAAT ATGATAAATA TGTAGCTAAG ACGCAAACGT CTCAAAATAA ACAATTAGAA	1980
	CAAGAAAAAC AAAATGATAG TGTGTGCAAA CAAGGAACTG CATCTAAATC ATCTGATGAA	2040
5	AATGTATCAT CAACAACAAA ATCAATGCCT AATTATTCAA AAGTTGATAA TACTATCAAA	2100
	ATTGAAAATA TTTATGCTTC ACAAATTGTT GAAGAAATTA GACGTGAACG AGAACGTAAA	2160
	GTGCTTCAAA AGCGTCGATT TAAAAAGCG TTGCAACAAA AGCGTGAAGA ACATAAAAAAC	2220
10	GAAGAGCAAG ATGCAATACA ACGTGCAATT GATGAAATGT ATGCTAAACA AGCGGAACgC	2280
	TATGTTGGTG ATAGTTCATT AAATGATGAT AGTGACTTAA CAGATAATAG TACAGATGCT	2340
	AGTCAGCTTC ATACAAATGG CATAGAGAAT GAAACTGTAT CAAATGATGA AAATAAACAA	2400
15	GCGTCAATAC AAAATGAAGA CACTAATGAC ACTCATGTAG ATGAAAGTCC ATACAATTAT	2460
	GAGGAAGTTA GTTTGAaTCA AGTATCGACA ACAAACAAT TGTGAGATGA TGAAGTTACG	2520
	GTTCGAATG TAACGTCTCA ACATCAATCA GCACTACAAC ATAACGTTGA AGTAAATGAT	2580
20	AAAGATGAAC TAAAAAATCA ATCCAGATTA ATTGCTGATT CAGAAGAAGA TGGAGCAACG	2640
	aATAAAGAAG AATATTCAgk AAGTCAAATC GATGATGCAG AATTTTATGA ATTAAATGAT	2700
25	ACAGAAGTAG ATGAGGATAC TACTTCAAAT ATCGAAGATA ATACCAATAG AAACGCGTCT	2760
	GAAATGCATG TAGACGCTCC TAAAACGCAA GAGTACGCAG TAACTGAATC TCAAGTAAAT	2820
	AATATCGATA AAACGGTTGA TAATGAAATT GAATTAGCAC CGCGTCATAA AAAAGATGAC	2880
30	CAAACAAACT TAAGTGTCAA CTCATTGAAA ACGAATGATG TGAATGATAA TCATGTTGTG	2940
	GAAGATTCAA GCATGAATGA AATAGAAAAG AATAACGCAG AAATTACAGA AAATGTGCAA	3000
	AACGAAGCAG CTGAAAGTGA ACAAATGTC GAAGAGAAAA CTATTGAAAA CGTAAATCCA	3060
35	AAGAAACAGA CTGAAAAGGT TTCAACTTTA AGTAAAAGAC CATTTAATGT TGTCATGACG	3120
	CCATCTGATA AAAAGCGTAT GATGGATCGT AAAAAGCATT CAAAAGTCAA TGTGCCTGAA	3180
	TTAAAGCCTG TACAAAGTAA GCAAGCTGTG AGTGAAAGAA TGCCTGCGAG TCAAGCCACA	3240
40	CCATCATCAA GATCTGATTC ACAAGAGTCA AATACAAATG CATATAAAC AAATAATATG	3300
	ACATCAAACA ATGTTGaGAA CAATCAACTT ATTGGTCATG CAGAAACAGA AAATGATTAT	3360
	CAAATGCAC AACAATATTC AGAGCAGAAA CCTTCTGTTG aTTCAACTCA AACGGAAATA	3420
45	TTTGAAGAAA GTCAAGATGA TAATCAATTG GAAAATGAGC AAGTTGATCA ATCAACTTCG	3480
	TCTTCAGTTT CAGAAGTAAG CGACATAACT GAAGAAAGCG AAGAAACAAC ACATCCAAAC	3540
50	AATACTAGTG GACAACAAGA TAATGATGAT CAACAAAAAG ATTTACAGTC ATCATTTTCA	3600
	AATAAAAATG AAGATACAGC TAATGAAAAT AGACCTCGGA CGAACCAACA AGATGTTGCA	3660

55

CCAAGTGTTC CATTACTAGA AGAACCACAA GTTATTGAGT CGGACGAGGA CTGGATTACA 3780
 GATAAAAAGA AAGAACTGAA TGACGCATTA TTTTACTTTA ATGTACCTGC AGAAGTACAA 3840
 5 GATGTAAGTG AAGGTCCAAG TGTTACAAGA TTTGAATTAT CAGTTGAAAA AGGTGTTAAA 3900
 GTTCAAGAA TTACGGCATT ACAAGATGAC ATTAAAATGG CATTGGCAGC GAAAGATATT 3960
 CGTATAGAAG CGCCTATTCC AGGAACTAGT CGTGTGGTA TTGAAGTTCC GAACCAAAT 4020
 10 CCAACGACAG TCAACTTACG TTCTATTATT GAATCTCCaA GTTTTAAAA TGCTGAATCT 4080
 AAATTAACAG TTGCATGGG GTATAGAATT AATAATGAAC CATTACTTAT GGATATTGCT 4140
 AAAACGCCAC ACGCACTAAT TGCAGGTGCA ACTGGATCAG GGAAATCAGT TTGTATCAAT 4200
 15 AGTATTTTGA TGTCTTTACT ATATAAAAT CATCTGAGG AATTAAGATT ATTACTTATC 4260
 GATCCAAAAA TGGTTGAATT AGCTCCTTAT AATGGTTTGC CACATTTAGT TGCACCGGTA 4320
 ATTACAGATG TCAAAGCAGC TACACAGAGT TAAAATGGG CCGTAGAAGA AATGGAACGA 4380
 20 CGTTATAAGT TATTTGCACA TTACCCATGT ACGTANTATA ACAGCATTTA ACnAAAAAGC 4440
 CCCATATGAT GAAAGAATGn CAAAAATTGT CATTGTAAaTT GATGAGTTGG CTGATTTAAT 4500
 25 GATGATGGTC CGCAAGAAGT TG 4522

(2) INFORMATION FOR SEQ ID NO: 40:

(i) SEQUENCE CHARACTERISTICS:

30 (A) LENGTH: 751 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

35 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 40:

TCAAGTTTAC GGATACGTAT ATATTTTGCA TGACATTTAG TGCAATAATA TTCATAATTT 60
 GCCCCTTGTG GATAGCTTTC AATGCTGTTA CAAAATCTAG GCGCTCCAAC CTGTTGGCTC 120
 40 AATCGTTTAA AATCTTGATC TTTATGTTGA TAACCTTTAC CAGCAATATG CAAGTGATAA 180
 TGACACAATT CGTGCAATAT AATTTTACAC ACAGCATCTT CTCCATAATG CTCATATTGT 240
 TTTGGATTAA TTTCAATATC ATGGGACTTT AAAAGATAAC GTCCGCCTGT TGTACGTAAC 300
 45 CTTTTATTAA AATATGCACA ATGTCGAAAC GTACGTCCAA ATTTTCTTC CGAAAGATTG 360
 TCAACCATTC GCTGAAGTTT GTCATTATTC ATGTGGATCA ATCATCGTTA ATGATACTTT 420
 GTCTTTATTT TTGCAATAC TGTAATCCAA AACGTCAACG ATATCACCAA CACTGACAA 480
 50 ATCCATTGGA TTTTACGA ACTTCTTAGA AAGTTTCGAA ACATGGACAA GTCCATCTTG 540

55

TTTCATTCTT TCTTGTAAT CTTC AATTGA TAGCACATCG GATTTAAGGA TTGGTGTTC 660
 AAACCTCGTCC CTTGGATCTC GATTAGGTGC GTTCAAGGAT TTAATAATAT CCTCTAATGT 720
 5 AGGTACACCG ACTTGTAATT CAATCGCCAG T 751

(2) INFORMATION FOR SEQ ID NO: 41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1076 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 41:

TCTCCAGCTT TAACTTGATC TGGCACTTTA ACAATTGTCT GATCCATACA TACGCGACCA 60
 20 ATAACCTCGC ATTGATGACC ATTTACATTT ACAAAGCTAC CTTGCATTAT GCGTAAATGG 120
 CCATCTGCAT ATCCAATAg TAACAATGCT ATTGTAGTTG GGTCAAGTAGC TGTATAAGTT 180
 GCACCATAAC TTACAGACTC ACCCGCTTGT AGCGTCTTTG TTTGAACTAC ATTAGCAATT 240
 25 AATTGCACAC TTGGTTTAAAG GTGTACTTTA ACTTTTTGCT GTACATACTC TGATGGATAA 300
 TATCCATAAA GGGAAATTCC TGGTCTTATT GCATTACAGA ATTGGCAATC CATTAATAGA 360
 GAGCCTGCTG AGTTCCTGACA ATGTATATAT TCAGGTTTAA TTGCTTCATT GACCATATCT 420
 30 TTAAAACGTT GATATTGTTT AGTTGTCATA TCTCCTGTTT CGTCAGCACA GGCAAAGTGT 480
 GTAAACACGC CTTCAAATAC AAGTTGCTCA TATTGTTGAA TGATTCAAT CACTTCTTGA 540
 TACGTTTTAG TATCTTTAAT ACCTAAACGT CCCATTCTTG TATCTAATTT AATGTGCAAC 600
 35 CATAACTTTT TCTCTTGCTC ACCAGAAATG TTTTAAATG CTTCTTTCAA CCACTGTTTA 660
 GACGGAACCG TTAAGGCAAC TCGGTGTTGT ATCGCTTTAT CAATATCTTT AGCTGGTAAC 720
 ACACCTAAGA CTAAAATTTT AGCAGTAATC CCATGCATTG TAAGTTCTAT CGCTTCATCT 780
 40 AACGTTGCTA CAGCAAAAAA TGTGGCGCCA TTTTCCATTA AATGACGTGC TACTTTAACA 840
 CTACCTAGTC CATAGGCATT GGCTTTAACG ACAGCCATCA CTGTTTTATT TGGATGCAAT 900
 GTACTGAATA CTTTGAAATT TGATGCAACA GCGTTTAAAT CTACATTCAT ATACGCAGAT 960
 45 CTATAATATT TATCCGACAT ATTACTTCCT CCTGTAATTC CCACAGGTTT TAAAACTAGA 1020
 TCTTAATTAT CATTGTATAA CAAATTTAAA ATGCTGACTT TTCTAAAACA ACTTGG 1076

(2) INFORMATION FOR SEQ ID NO: 42:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 2930 base pairs

(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 42:

	TGACCACAAT GCCCAATACA ACCATCCCAT GGTAAAGCCA AGAGATGAGT CAATAAAGCG	60
10	TGTTGAATAA GAGCTGAATG AACCTGATAC TGGATAAAAT GTTGCCAACT CTCCAATTGA	120
	TGACATTAAAG AAATATAGCA TGACACCAAT AACAAGATAA GCGAGTATAG CGCCTCCAGG	180
	ACCAGCTTGA GAAATGATAT TACCAGTAGC TACAAATAGA CCAGTCCCAA TTGCACCACC	240
15	TATAGCAATC ATGGAAATGT GTCTTGAGTT AAGACTACGG TTCATTTTAT TATCTTCCAT	300
	ATTTAGTCTC CCATCTATTT AAATATACCC ATTATTGTAA GCTTTTTAAG TGTACTATTC	360
	AATAACTATT TAGTACTGTA AAGCGAAAAA ATTAAATTT TCTGATTTT TAATCATCTT	420
20	GAGCATGTTT AATTGTAATT TTGATGGGGT TAAATTATAA TATGTATTAA ATTATAATTA	480
	TnATAAATTG TGGAGGGaTG ACTATGTCAC AACAAGACAA AAAGTTAACT GGTGTTTTTG	540
	GGCATCCAGT ATCAGACCGA GAAAATAGTA TGACAGCAGG GCCTAGGGGA CCTCTTTTAA	600
25	TGCAAGATAT TACTTTTTTA GAGCAAATGT CTCAATTGTA TAGAGAAGTA ATACCAGAAC	660
	GTCGAATGCA TGCCAAAGGT TCTGGTGCAT TTGGGACATT TACTGTAACT AAAGATATAA	720
	CAAAATATAC GAATGCTAAA AtATTCTCTG AAATAGGTAA GCAAACCGAA ATGTTTGCCC	780
30	GTTTCTCTAC TGTAGCAGGA GAACGTGGTG CTGCTGATGC GGAcGTGACA TTCGAGGATT	840
	TGCGTTAAAG TTCTACACTG AAGAAGGGAA CTGGGaTTTA GTAGGGAATA ACACACCAGT	900
	ATTCTTCTTT AGAGATCCAA AGTTATTTGT TAGTTTAAAT CGTGCGGTGA AACGAGATCC	960
35	TAGAACAAAT ATGAGAGATG CACAAAATAA CTGGGATTTT TGGA CGGGTt TCCAGAAGCA	1020
	TTGCACCAAG TAACGATCTT AATGTCAGAT AGAGGGATTG CTAAAGATTT ACGTCATATG	1080
40	CATGGGTTCG GTTCTCACAC ATACTCTATG TATAATGATT CTGGTGAACG TGTTTGGGTT	1140
	AAATTCCATT TTAGAACGCA ACAAGGTATT GAAAACTTAA CTGATGAAGA AGCTGCTGAA	1200
	ATTATAGCTA CAGATCGTGA TTCATCTCAA CGCGATTAT TCGAAGCCAT TGAAAAAGGT	1260
45	GATTATCCAA AATGGACAAT GTATATTCAA GTAATGACTG AGGAACAAGC TAAAAACCAT	1320
	AAAGATAATC CATTTGATTT AACAAAAGTA TGGTATCACG ATGAGTATCC TCTAATTGAA	1380
	GTTGGAGAGT TTGAATTAAA TAGAAATCCA GATAATTACT TTATGGATGT TGAACAAGCT	1440
50	GCGTTTGCAC CAACTAATAT TATTCCAGGA TTAGATTTTT CTCCAGACAA AATGCTGCAA	1500
	GGGCGTTTAT TCTCATATGG CGATGCGCAA AGATATCGAT TAGGAGTTAA TCATTGGCAG	1560

55

GGTCAAATGC GCGTAGTTGA CAATAACCAA GGTGGAGGAA CACATTATTA TCCAAATAAC 1680
CATGGTAAAT TTGATTCTCA ACCTGAATAT AAAAGCCAC CATTCCCAAC TGATGGATAC 1740
5 GGCTATGAAT ATAATCAACG TCAAGATGAT GATAATTATT TTGAACAACC AGGTAAATTG 1800
TTTAGATTAC AATCAGAGGA CGCTAAAGAA AGAATTTTAA CAAATACAGC AAATGCAATG 1860
GAAGGCGTAA CGGATGATGT TAAACGACGT CATATTCGTC ATTGTTACAA AGCTGACCCA 1920
10 GAATATGGTA AAGTGTTGTC AAAAGCATTG GGTATTGATA TAAATTCTAT TGATCTTGAA 1980
ACTGAAAATG ATGAAACATA CGAAAACCTT GAAAAATAAA TTTGATATGT AGTTTCTATA 2040
TTGCGTAGTT GAGCAGTTTA TGATATCATA ATAAATCGTA AAGATTCCTA ACAAGAGAGG 2100
15 GTGTTTAAACG TGCGCGTAAA CGTAACATTA GCATGCACAG AATGTGGCGA TCGTAACTAT 2160
ATCACTACTA AAAATAAACG TAATAATCCT GAGCGTATTG AAATGAAAAA ATATTGCCCA 2220
AGATTAAACA AATATACGTT ACATCGTGAA ACTAAGTAAT TCTTATCATT CAAATACGAC 2280
20 GATTTGAAAA TAAAGCGGGC TTACCTATTA TATTGGGGAG CTCGCTTTTT TATGAAATTT 2340
TTGTGAAGAG TGATTAATGG ATTGAGTTTC ATCGGTAGAA CAATATATGA TTATATTAGT 2400
TGTTACTTTA TTAAATTTG AGAATATTTA TAGAAGGAAA TAGATTACTG ATTTTATAAA 2460
25 GTCACTTTGT TAGCGAATGC TTGAAAGAGT ATTTAATATA GTAGAATTTA AAATTTCAAA 2520
GCGGAATTTA ATAAGTACGA AGTAGTTCTG GGTATGTTTT ATAAATGTTT GATAATACAC 2580
30 TTTAATCTTA AATATGATGG TTTAGAAAAT GATTTAACAA AGAAATGAaA CTTTACTGTT 2640
GAATTATGTG AGGATTGTGT TATTATATAA ATCGTAATAA TTACGATTTG ATAAAAAGTG 2700
AGGTAACTAT ATATGGCTAA GAAATCTAAA ATAGCAAAAG AGAGAAAAAG AGAAGAGTTA 2760
35 GTAAATAAAT ATTACGAATT ACGTAAAGAG TTAAAGCAA AAGGTGATTA CGAAGCGTTA 2820
AGAAAATTAC CAAGAGATTC ATCACCTACA CGTTTAACTA GAAGATGTAA AGTAACTGGA 2880
AGACCTAGAG GTGTATTACG TAAATTTGAA ATGTCCTCGTA TTGCGTTTAG 2930

40 (2) INFORMATION FOR SEQ ID NO: 43:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 3606 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
45 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 43:

50 CTTCTTGCCA TGGCTCTCTT TATTAAAAA TGCTTCCAAC TTGTCCATTT GATTGTTTCT 60

55

EP 0 786 519 A2

	TTATAAAAAA CTAATTTTAC AAATGCTTTT GCGTTCTTAC AAAAAATGCA TTTGACTATT	180
	ATTATAATAA GCGTATAATT GTCGCATATT ATTTTTTGTA TTTTGGCAA TAACGAAGGA	240
5	GTATTTATGA ATAAAGACAA GCAATTGCAC AACGACAAAA TCAATCTATC CCAATTAGTC	300
	TTATTAGGGT TAGGCTCTTT AATAGGATCT GGTGGCTAT TTGGTGGTG GGAAGCATCA	360
	TCAATAGCTG GACCAGCAGC AATCATATCA TGGGTTCTTG GATTCCTAGT CATTGGAACC	420
10	ATTGCCTATA ACTACATTGA AATCGGCACA ATGTTTCTCTC AATCAGGTGG CATGAGTAAC	480
	TATGCCCAGT ATACACATGG CTCATTATTA GGCTTTATTG CTGCTGGGC GAATTGGGTG	540
	TCTTTGGTGA CAATAATACC TATCGAAGCT GTGTCAGCTG TTCAATATAT GAGTTCTTGG	600
15	CCGTGGCATT GGGCGAAACC AATGAGATAT TTAATGGAAA ATGGCTCTAT TAGCACATAC	660
	GGATTGCTAG CTGTATATCT CATCATTGTT ATTTTTTCAT TATTAACTA TTGGTCCGTA	720
	AAACTTTTAA CATCATTTAC GAGTTTAATT TCTGTATTTA AATTAGGCGT ACCCATGTTA	780
20	ACCATCATCA TGTTGATGCT ATCAGGATTC GACACTTCAA ATTACGGCCA TTCGGCAAGC	840
	ACATTTATGC CTTACGGAAG TGCACCGATT TTTGTGCAA CAACAGCATC AGGGATTATT	900
	TTTTCATTCA ATTCATTCCA GACAATTATT AATATGGGTT CAGAAATTAA AAATCCTGAA	960
25	AAAAATATCG CAAGAGGCAT CGCTATCTCA CTGTCAATCA GTGCAGTGTT GTACATCATT	1020
	TTACAAAGTA CGTTTATCAC TTCTATGCCT CAATCAATGT TACAACATAG TGGATGGAAT	1080
	GGCATCAACT TCAATTCACC ATTTGCTGAT TTAGCTATCT TATTAGGAAT TAATTGGCTC	1140
30	GCAATTTTAC TATACATTGA AGCTTTTGTA TCACCATTCTG GTACTGGCGT GTCATTTGTC	1200
	GCCGTTACAG GTCGAGTTTT ACGAGCAATG GAGAAAAATG GACATATCCC TAAATTTCTT	1260
35	GGGAAGATGA ATGAAAAATA TCATATCCCA CGTGTAGCAA TCATCTTTAA TGCCATCATT	1320
	AGTATGATTA TGGTTACATT ATTTAGAGAT TGGGGTACGC TAGCAGCAGT TATTCTACT	1380
	GCAACTTTAG TAGCCTATTT AACTGGCCCA ACGACAGTGA TTGCATTAAG AAAAAATGGGA	1440
40	CCAACAATGA CTCGTCCATT TAGAGCAAAA ATTTTAAAAG TAATGGCACC ATTATCATTT	1500
	GTATTAGCTT CATTAGCTAT ATATTGGGCA ATGTGGCCAA CAACGGCTGA AGTTATTTTA	1560
	ATCATTATAC TTGATTACC AATCTACTTC TTCTATGAAT ATCGTATGAA TTGGCGTAAT	1620
45	ACAAAGAAAC AAATGGTGG TAGCTTATGG ATTATTGTAT ATTTAATCGT GCTATCAATA	1680
	CTGTCAATTA TAGGAAGCAA AGAATTTAAA GGCTTAAATA TGATTCACTA TCCATTTGAC	1740
	TTTATCGTTA TTATTATTGT GGCATTATC TTCTATTACA TCGGTACAAC GAGTTCATT	1800
50	GAAAGCGTCT ATTTCCGTCG CGCAACACGA ATCAATACGA AGATGCGTGA GTCATAAAT	1860

55

EP 0 786 519 A2

	CACACACATT AACCAACCAT TGATTTC AAC ATCTTG GTTTTTATT TTGAAAATCG	1980
	GTTATAAATA ACTAACATAA CAAGATGATG ATCAGGCTGG GACATAAATC AATGTTCTAT	2040
5	GCTCTACGAA gTTATATTGG CAGTAGTTGA CTGAACGAAA ATGCGCTTGT AACAAGCTTT	2100
	TTTCGATTCT AGTCAGGGGC CCCAACACAG AGAATTTCTGA AAAGAAATTC TACAGGCAAT	2160
	GCAAGTTGGG GTGGGACGAC GATAAAGAAA TACTTTTTCT ATAGAAATTA GTATyCTTA	2220
10	TGCATGAGTT TTACTCATGT ATTCATATTT TTAAGTACAC ATTAGCTGTG GCTAATGTAT	2280
	AAGAACCACT ACATAATAAA TCATTTGTGG CTCTTTATCA TTTCTGTCCC ACTCCCGTAG	2340
	AAGTACATCA TATAATGCTG AAAATGGTTT GAGTTAAAC AGATATCAAG CTCGTCTGAT	2400
15	TCACTCACA AATTGTCTTG TTATACTTGT CACCTATCAT CTATAGACCG TGGTATGATT	2460
	AAATTGGGGA TGATAAAGGA GGTAAATAAA TATGAAGATT AATACTACAG GTGGTCAAAT	2520
	TCATGGTATT ACACAAGATG GTTTAGATAT CTTCCTTAGGC ATTCTTATG CAGAACCACC	2580
20	AGTTCATGAC AATCGCTTTA AACATTCTAC GTTAAAAACA CAATGGTCAG AGCCAATTGA	2640
	TGCAACTGAA ATACAACCCA TCCCACCGCA ACCAGACAAC AAATTAGAAG ATTTTTTCTC	2700
	CTCACAATCT ACAACTTTTA CTGAACATGA AGACTGTTTA TATCTAAATA TTTGGAAACA	2760
25	ACATAATGAT CAGACGAAGA AACCTGTCAT CATTTATTTT TATGGTGGTA GTTTTGAAAA	2820
	TGGTCATGGT ACAGCCGAAC TCTATCAACC GGCACATTTA GTACAAAATA ACGACATTAT	2880
	CGTTATTACA TGCAATTATC GTTTAGGCGC ATTAGGATAT TTAGACTGGT CATATTTTAA	2940
30	TAAAGATTTT CATTCCAATA ATGGCCTTTC AGATCAAATC AATGTCATAA AATGGGTGCA	3000
	TCAATTTATT GAATCCTTCG GTGGCGACGC TAATAACATT ACITTAATGG GTCAGTCTGC	3060
	AGGCAGTATG AGCATTTTGA CTTTACTTAA AATACCTGAC ATTGAGCCAT ACTTCCATAA	3120
35	AGTCGTTCTA CTAAGTGGCG CACTACGATT AGACACCCTT GAGAGTGCAC GCAATAAAGC	3180
	ACAACATTTT CAAAAAATGA TGCTCGATTA TTTAGATACA GATGATGTTA CATCATTATC	3240
40	GACAAATGAT ATTCTTATGC TGATGGCGAA gcTAAACAA TCTCGAGGAC CTTCTAAAGG	3300
	GCTTGATTTA ATATATGCGC CTATTAACAG AGATTATATA CAAAATAATT ATCCAACAAC	3360
	GAAACCAATT TTTGCATGTT ATACAAAAGA TGAAGGCGAT ATTTATATTA CTAGTGAACA	3420
45	GAAAAAATTA TCGCCGCAAC GCTTTATCGA CATTATGGAA TTAAATGATA TTCCTTTAAA	3480
	ATACGAAGAT GTTCAGACGG CGAAGcAACA ATCTTTAGCG ATTACACATT GTTATTTCaA	3540
	ACAGCCGATG aAGCAATTTT TACmACmACT CAATATACmA GATTCCAACC GCACCAACTA	3600
50	TGGCTT	3606

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15109 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 44:

10	GAAATTAAAA AAGCAATTGG nACAAGATGC AACAGTGTCA TTGTTTGATG AATTTGATAA	60
	AAAATTATAC ACTTACGGCG ATAAGTGGG TCGTGGTGGG GAAGTATTAT ATCAAGCATT	120
	TGGTTTGAAG ATGCAACsAG AACAAACAAA GTTAACTGCA AAAGCAGGTT GGGCTGAAGT	180
15	GAAACAAGAA GAAATTGAAA AATATGCTGG TGATTACATT GTGAGTACAA GTGAAGGTAA	240
	ACCTACACCA GGATACGAAT CAACAAACAT GTGGaAGAAT TTGAAAGCTA CTAAAGAAGG	300
	ACATATTGTT AAAGTTGATG CTGGTACATA CTGGTACAAC GATCCTTATA CATTAGATTT	360
20	CATGCGTAAA GATTTAAAAG AmAAATTAAT TAAAGCTGCA AAATAATTCA GCTATATAAG	420
	TTAGTGAAAT GAGAGTCTGA AACATATCAA TCTTTTGATA TTGTATTAGG CTCTTATTTT	480
	TATAGCTAGA AAGTTAGATA TTTGTATTTT TTAAATAAT AAGTGCCGTT GTTATCGTTC	540
25	AATTTAATTA ATGATAGATT AGTATTATTA TAGCTAAAGT AGTATACCTG AGAAAATAGC	600
	TCAATGTATC TCTTTATTAA TAAGTTATAT CATAATTATT TTAGTGCATA CTTTATGGAA	660
	GGGATATCAG GGAATGGCTT TCAATTAAAG AAGAGGTTTA AAAGGATTAC AACAGAATGT	720
30	TATGATTTTG TAGAAAGATA TATAACAACG TTTTATAAAA ACATAATATT GTTAATGGAA	780
	AATGAAATGT AAGGGGGATT TCGAGTGACT AAGAAAGTTT ATTTTAACCA CGATGGTGGT	840
35	GTAGATGATT TAGTATCTCT ATTTTATTA TTACAAATGG AAAACGTTCA ATTGATAGGG	900
	GTCAGTACAA TTGGTGCTGA TTGTTATTTA GAGCCATCTT TGAGCGCATC AGTAAAAATT	960
	ATTAAATCGTT TTTCAAATGA AGATATTCAA GTTGCGCCAT CATATGAACG AGGAAAAAAT	1020
40	CCATTTCTTA AAGAATGGCG TATGCATGCC TTTTATATGG ACGCATTGCC AATTTTAAAT	1080
	GAGCCAGTCA AACATGTTGC TTCAAATGTG AGCGACAAAG AAGCCTTTGA AGACATTATT	1140
	CAAACCTTAA AGAGACAATC AGAAAAAGTA ACATTATTAT TTACAGGCCC GCTTACAGAT	1200
45	TTAGCAAAAG CACTACAAAA AGATTCACTCT ATCGTTCACT ATATAGAAAA ATTAGTTTGG	1260
	ATGGGTGGCA CCTTTTACC AAAAGGAAAT GTTGAAGAAC CTGAGCATGA TGGTCTGCA	1320
	GAATGGAATG CATATTGGGA TCCAGAAGCG GTTAAATTTG TTTTGTATAG CGATATAGAG	1380
50	ATTGATATGG TTGCTTTAGA AAGTACGAAT CAAGTACCGC TAACGTTAGA TGTTAGACAA	1440

55

EP 0 786 519 A2

	GTACCACCAT TAACACACTT TATAACAAAT TCTACTTACT TTTTATGGGA TGTTTAAACG	1560
	ACTGCTTATA TTGGTAACAA GGAAGTTGGT CATTCAATTG AGAAAAAGT CGATGTAATA	1620
5	AGTTATGGAC CAAGTCAAGG TAAGACATTT GAGTGTAAG ATGGGCGCAA AATTAATGTC	1680
	ATAAATCATG TAGATAACAA CGCATTTTTT GATTATATAA CTGCACTTGC TAAAAAGTA	1740
	AATTAACAGC TGTGTAGAAT AATTAAGGTT TTAATTTATA TAGAACAACT TATTGTAAAC	1800
10	TTTTCATTTT TAAAGTTTA CAATGGTGCT ATAATAATGG TCATGAAATA CGAAAGGAAG	1860
	TAAAAAATGA CAACAAAACA GTTAGTATAT ACAGCTTTAA TGACAGCGAT TATCGCTATT	1920
	TTAGGATTGG TACCGTAAT TCCACTACCA TTTTCTTCAG TACCAATTGT ACTTCAAAAC	1980
15	ATTGGTATTT TCTTAGCAGG TCGGATTTA GGACGTAAAT ATGGCACATT AAGTGTATC	2040
	GTCTTTTTAT TATTAGTAGT TGCTGGCTTG CCATTGTTAT CAGGTGGTCG CGGTGGCATC	2100
	GGTGTATTCG CAGGTCCTTC AGCAGGGTTT TTAATTATTAT ATCCAGTTGT AGCATTGATG	2160
20	ATTGGGGCGA TTCGAGATAG ATTCATCAAT GAAATTAATT TCTGGATTTT ATTCGTTGGT	2220
	ATTTTAGTTT TTGGTGTAT AGCATTAGAT GTTATTGGTA CATTGATTAT GGGCATGATT	2280
	ATTAACATAC CATTTACGAA AGCTATTTCA ATTTCAATTAG CTTATTTGCC TGGTGATATA	2340
25	TTAAAGCAA TTGTAGCAAG TTTGATTGGT ACAGCTTTAC TTAATCACTC GCAGTTTCGT	2400
	CAAATTATGG GAATAAAATA ATCATATTTA AGATAGTAAA GTAATTGAAT AAGTTGCTTT	2460
	GAAATTTATA AAAGTGAAAG GAGTAGGTGT CAATGGCTAG TATAAGTATG TCAGATATAT	2520
30	ATTGTAACGG CACTATATTT GAAAATGACG ACGAGCAGTT GATTTATTTA ACGCCTCTT	2580
	TTCCACAACG ATACACAAGT AACACATGGA TATATAAAAA GACGCCTACC CAAGAGCGAT	2640
	GGCTGAAAGA CTTAGAACGT CAACATCAAT TACATACAAA TCAAGGTTCA AATCATTATG	2700
35	CGTTTAGTTT CCCGGAATTA GAACAACCTG ATAATCATTG GATGGCTATG TTAAAGATA	2760
	TGAATTTTGA ACTAGGTATT ATGGAATTGT ATGCCATAGA AAGTGATGCG CTTGCCAATT	2820
	TGCCGCGTAA CTCTGACGTT GAAATTGCCA TCGTTGACGA GTCGCATATA GATGCCTATT	2880
40	TAAAAGTTGC ATATCAGTTT AGTTTGCCAT TTGGAAAAGA CTATGCAGAT GCACATGAAG	2940
	AAATGGTAAG GGAACATTAT CAAAAAGATG TGATTAAACG CTTAGTAGCT TATTTAAATA	3000
45	ATGAACCTAT TGGCGTTGTA GATGTCATTG AAAGTGAAAA TTACATTGAA TTAGATGGAT	3060
	TTGGTGTATT AGAACAATTT CGGCACCAAG GAATTGGATC TACAATTCAA TCGTTGATAG	3120
	GTGAATACGC CATATCAAAA AATCACAAAC CAATCATATT AGTTGCAGAT GGTGAAGATA	3180
50	CAGCAAAAGA TATGTATGCA AAGCAAGGTT ATGTCTATCA ATCGTTTGT TATCAAATAT	3240

55

	TAAGCTGGTT TCGAGTAGAA ATCAACTTAC TGCTTTTTTAA ATTGTTTTGA GCTACTTATA	3360
	CTTATAAAAA TAGTGCCTTT AAATTGTTGA TTCATGTAGA ATATCGTTCA TTATGACACA	3420
5	CTATAATGAA TATGTTATTG TTCAGAATCA ATGATACGTT CTGGATGACT GTATATATTA	3480
	AAGCCACCAT TTCGAATAAA TCCAACGCG GTAATATTTA GGTCAATTAGC TAAGGTTACA	3540
10	GCAAGCGTTG TCGGAGCTGA TTTAGATAAA ATGACGCCAA CACCAATTTT TGCGGCTTTA	3600
	ATTAAAAATT CTGATGAAAT ACGTCCACTA AAAATTAATA CTTTATCTCG GACAGTAATA	3660
	TGTCGCTGAA TACAAAATCC ATATAATTTA TCTAGACGCT TATGTCTACC AATGTCTTGT	3720
15	CGATGTACAA AAAATGTCAA ACCATCGCTT ATAGCAGCAT TATGTAAGCC ACCTGTTTCT	3780
	TGGTAAATAT GACTTGCACT TTGTAATCGA GTCATCATGT TAATAATTTG CATTGGAGTT	3840
	AAAGTGATTT TAGACATAGA TGTTTTAGCG ATAGCAGCAT CATTTTGAAA ATAAAACTCA	3900
20	CGACTCTTTC CGCAACAAGA TGCAATCATT CGTTTTGTGG AATATTGAAA GCGATCGCCT	3960
	AAATCTTTAT TAAGTTCAAC ATGGGCAAAA CCTTTACTAT CATCAATCAG TACAGATTTT	4020
	AATTCATCTC GCTTTAAAT GGCACCTTCC GAAGCCAGAA ATCCAATGAC TAACTCCTCA	4080
25	AGGTTTGTG GACTGCATAT AACAGTCGCA AATTCTTCAC CATTCACCAT AATTGTAAGT	4140
	GGAAATCTG TCACATATTG ATCTGTTGTA TTGAATAATT TTCCATCTTC ATATCTAACA	4200
	ATTGGTTGAC CTAAAGATAC ATCTTTGTTC ATTATCTAAC CCCTTTAATT AGCTTAACT	4260
30	TTATTTTAAA GCAATTTGCT TAAAATTTTA ACATATTTGC TTAAGTTTGA AATTTGATTG	4320
	ATAAAAATTA ATAGCGAGCA ATCTGTTTGA TTTAAATTGA ATTCGAGAAT ATACATACTA	4380
35	GGGCATCAAT TAATAATAT CAATCTTATG CAAATTTGAC AATTGTTTGA ATCAATATAT	4440
	AAACAGGCAA CGGTTCTTTT CAAATATAAT AGTAAGTGTA TAATGAAAAT GTAAATATTA	4500
	TTAAAAATGG GGGTTCCTC AATGAAATTG AAACGTTTAT TTGCTGTTGT GATTGCAATG	4560
40	CTTTTAGTAT TAGCTGGTTG CTCTAATTCT AACGATAATA ATGAAAGTAA AAAAGATGAC	4620
	GCAGACAATG GTAAGAAACA AGAGATTCAA GTTGCAGCGG CAGCAAGTTT AACAGATGTA	4680
	ACCAAGAAAT TAGCTTCAGA ATTTAAAAAA GAGCATAAAA ATGCTGATAT TAAATTTAAC	4740
45	TATGGTGGAT CAGGGGCATT AAGAAAACAA ATTGAATCAG GCGCACCTGT TGACGTATTT	4800
	ATGTCTGCAA ATACTAAAGA TGTAGATGCA TTTAAAGACA AGAATAAAGC GCATGATACA	4860
	TATAAATATG CGAAAAATAG TCTAGTATTA ATTGGTGATA AAGATTCAAA TTACACTTCA	4920
50	GTAAAAGACT TAAAAGACAA TGATAAATTA GCATTAGGTG AAGTGAAAAC TGTACCAGCA	4980
	GGAAAATATG CGAAACAGTA TTTAGATAAC AATAACTTAT TTAAAGAAGT CGAAAGTAAA	5040

55

EP 0 786 519 A2

	CAAGGTTTTG TGTATAAAAC TGA	CTTATAT AAACAAAATA AAAAAATTGA TACTGTAAAA	5160
	GTAATTAAAG AAGTAGAACT TAAGAAGCCA ATCACATACG AAGCTGGTGC TACATCAGAT		5220
5	AGTAAATTAG CAAAAGAGTG GATGGAATTC TTAAATCAG ATAAAGCTAA AGAAATACTA		5280
	AAAGAATACC ACTTTGCAGC ATAAGGAGTT GTAATCCATG CCTGACTTAA CACCTTTTTG		5340
	GATATCAATA CGAGTTGCTG TAATCAGTAC GATTATTGTA ACGGTTTTAG GTATTTTTAT		5400
10	ATCTAAATGG TTGTATCGTC GTAAGGGTTC GTGGGTTAAA GTATTGGAAA GTTTATTGAT		5460
	ATTACCTATT GTTTGGCCGC CAACGGTATT AGGTTTTATT CTATTAATCA TCTTCTCGCC		5520
	AAGAGGACCA ATCGGTCAAT TCTTTGCGAA TGTACTACAT TTACCTGTAG TGTTCACTTT		5580
15	GACAGGTGCT GTGATAGCAT CTGTCATTGT TAGTTTTCCA CTAATGTATC AACATACTGT		5640
	GCAAGGCTTC AGAGGTATAG ACACGAAAAT GATTAATACA GCTAGAACGA TGGGAGCAAG		5700
20	TGAAACGAAA ATTTTCCTCA AATTAATTTT ACCATTAGCT AAACGCTCTA TTTTAGCAGG		5760
	TATAATGATG AGTTTTGCTC GTGCATTAGG TGAGTTTGGT GCTACATTAA TGGTTGCAGG		5820
	ATATATTCCA AATAAACGA ATACACTACC TTTAGAAATA TACTTCTTAG TGGAACAAGG		5880
25	TAGAGAAAAT GAAGCGTGGT TATGGGTATT AGTGCTAGTC GCATTCTCTA TTGTGGTTAT		5940
	ATCTACAATT AATTATTGA ATAAAGATAA ATATAAGGAG GTCGACTAGA TGCTTAAAT		6000
	CAATGTGAAA TATCAATTAA AGAACACTTT AATTCGCATC AATATAGATG ATACTGAACC		6060
30	AAAAATTTAT GCAGTTCGTG GTCCATCTGG CATTGGTAAA ACTACTGTTT TAAATATGAT		6120
	TGCCGGATTA CGTAAAGCAG ATGAAGCTAT TATCGAAGTG AATGGGCAAT TACTTACTGA		6180
	TACGGCAAAA AACGTGAATG TTAAATTC AACAACGACGT ATTGGATATC TGTTTCAAGA		6240
35	CTACCAATTG TTTCCTAATA TGACGGTCTA TAAAAATATT ACTTTTATGG CTGAACCATC		6300
	TGAAACATC GATCAATTAA TTCAAACCTT AACATTGAT CATTTGATGA AACAAATATCC		6360
40	TATGACATTG TCAGGTGGAG AGGCACAACG TGTAGCACTT GCACGTGCAC TTAGCACrAA		6420
	ACCAGATTTA ATTTTATTAG ATGAACCTTT TTCTAGTTTG GATGATACTA CAAAAGATGA		6480
	GAGTATTACA TTAGTTAAAC GTATTTTCAA CGAATGGCAA ATACCAATCA TATTTGTGAC		6540
45	ACATTCAAAC TATGAAGCAG AACAAATGGC TCATGAAATT ATTACAATTG GGTAATCATT		6600
	TATTTGCCAT TAAAGAGTTT AGAACGTATT TAAAATTGTA GAAGTGAATG CTTCTATCAG		6660
	CATTTTAATG ATGTTTAAA CTCTTTTTTA GGGGCAGTTT TTTTGAGAGA CATTGACGCG		6720
50	CGTCATATAA TGAAAGTAAT GATAAAAAGA AAGGATAACT TAATGTGAGT CAAGAACGTT		6780
	ATTCAAGGCA AATTTTATTT AAACAAATAG GTGAAATAGG TCAAAGCAAA ATAAATCAAA		6840
55			

	GAGCAGGCAT TGCCAAACTA ATCATTGTTG ATAGAGATTA TATTGAATTT AGTAATTTAC	6960
	AAAGACAAAC ATTGTTTACT GAAGAAGATG CTTTGA AAAAT GATGCCCTAAG GTGGTTGCAG	7020
5	CTAAAAAGCA TTTGCTAGCG TTACGTAGTG ATGTTGATAT TGATGATTAT ATTGCCCATG	7080
	TGGATTATTA TTTTTTGGAA ACACATGGAC AGGACGTTGA CGTTATTATT GATGCAACCG	7140
	ATAACTTTGA AACACGACAA CTGATTAATG ATTTTGCATA TAAATATCGT ATACCTTGGA	7200
10	TTTATGGTGG TGTGTACAG AGTACATATA CAGAAGCTGC ATTTATACCT GGTAAACAC	7260
	CTTGCTTTAA CTGTTTGGTA CCACAATTGC CAGCATTAAA TTTAACATGT GATACAGTAG	7320
15	GGGTCATTCA ACCTGCCGTG ACGATGGCAA CAAGTTTACA ATTAAGAGAT GCGATGAAAG	7380
	TATTAACGGA ACAACCAATT GACACAAAAA TAACCTTATGG CGATATTTGG GAAGGTAGTC	7440
	ATTATTCATT TGGTTTCAGT AAAATGCAAC GTTCAGACTG TACAACTTGT GGAGATGTAC	7500
20	CAAGTTATCC GTATTTAAAC AAGAATGAAC AACGTTATGC AACATTGTGT GGTAGAGACA	7560
	CTGTACAGTA TGAAAATGCA TCAATTACAC ACGACATTCT TGTTC AATTT TTAACAAC	7620
	ATCAGTTAAA TTATCGCAGT AATTCGTATA TGGTTATGTT TGAATTTAAA GGACACCGCA	7680
25	TTGTTGCTTT TAAAGGTGGA AGGTTTTTAA TACATGGCAT GACACGCACA TCAGATGCCA	7740
	CACATCTAAT GAATTTATTG TTTGGATAAA AAAAGATAAG ACAAAGGAG TGTAATATTA	7800
	TGGGCGAACA TCAAAACGTT AAATTGAATC GTACAGTTAA AGCAGCCGTA CTAACGGTAT	7860
30	CAGATACTAG AGACTTTGAT ACAGATAAAG GTGGTCAATG CGTGCGCCAA CTATTACAAG	7920
	CAGATGACGT TGAAGTGAGT GACGCACATT ATACAATTGT GAAAGATGAA AAAGTAGCCA	7980
35	TCACGACGCA GGTGAAGAAG TGGTTAGAAG AAGATATTGA TGTCATCATT ACGACTGGTG	8040
	GAACAGGTAT TGCACAACGT GATGTGACGA TTGAAGCAGT AAAACCACTT TTAATAAAG	8100
	AGATAGAAGG CTTTGGGGAA TTGTTTAGAT ATTTGAGTTA TGTGAAGAT GTTGGCACGC	8160
40	GTGCATTATT GTCTCGTGCT GTAGCAGGTA CAGTTAATAA TAAATTGATA TTTTCGATT	8220
	CAGGATCAAC AGGCGCAGT AAATTAGCAT TAGAAAAGCT CATTAAACCA GAATTAAATC	8280
	ATCTGATTCA TGAGCTTACA AAATAATTTA TTGATTGAT TGGCGTTGAA AATCTCCAGA	8340
45	TTTACCGCCA GACTTGCTTT CAAGGTAGGT TTCGCCAATA ATCATACCTT TATCAACTGC	8400
	TTTCGTATG TCGTAAATGG TTAAAGCCGT TGCTGATGCA GCGGTTAAAG CTTCCATTTC	8460
	AACACCGGTT TTGCCAGTTG TAGAGACAGT TGTTTGAATG TTTAAAGTAT AAAGGGGTGC	8520
50	ATTTGTTTCA TCCCAGCTGA AGTGAACATC TATGCCAGTC AATGGTAATG GATGGCACAT	8580
	CGGAATAAGT GTTGATGTAT TTTTGGCAGC CATAATACCA GCGATTTGAG CAGTGTTC	8640

55

EP 0 786 519 A2

AATGCTTGAA TGAGCGACAG CAGTTCCTTT TGTAATTGT TTGTCTGATA CATCGACCAT 8760
 TTTGGCGTGG CCTTGTGAT TAATATGAGT AACTCAGTC ATTTTACCCC TCCTAGTGCA 8820
 5 TCTAGTATAT CATGAAAAA TAAAGTTTT GGAGATGATT TTTAATGGTA GTAGAAAAA 8880
 GAAACCCAAT CCCAGTTAAA GAAGCAATTC AACGTATCGT TAATCAGCAG AGTTCAATGC 8940
 CGGCAATTAC GGTAGCACTT GAAAAAGTC TAAATCATAT CTTAGCAGAA GATATTGTAG 9000
 10 CTACTTATGA TATACCAAGG TTTGATAAAT CACCTTATGA TGGTTTGTCA ATTGCGCAGT 9060
 TTGATTACACA AGGGGCAAGT GGTGAGAATC GCATTGAGTT TAAAGTGATT GATCATATTG 9120
 GTGCGAGGTT AGTTTCTGAT AAATTAGTTG GGGATCACGA AGCGGTGCGT ATTATGACTG 9180
 15 GAGCACAAAT ACCTAATGGC GCAGATGCTG TTGTTATGTT TGAACAAACG ATTGAACTAG 9240
 AAGATACATT TACAATTCGT AAACCATTTT CAAAAATGA AAATATATCT TAAAAAGGTG 9300
 20 AAGAAACAAA GACAGGCGAT GTTGTCTTAA AAAAAGGACA AGTAATTAAT CCAGGGGCTA 9360
 TCGCGGTCTT TGCAACATAT GGCTATGCAG AGGTTAAAGT TATTAAGCAA CCGAGTGTG 9420
 CTGTTATTGC AACAGGAAGC GAATTATTAG ATGTTAATGA TGTATTAGAA GATGGGAAAA 9480
 25 TTCGTAATC TAATGGCCCA ATGATTCGTG CCTTAGCAGA AAAATTAGGT CTTGAAGTTG 9540
 GTATTTACAA AACACAAAAA GATGATTTAG ATAGTGGCAT CCAAGTCGTT AAAGAAGCTA 9600
 TGGAAAAACA TGATATCGTT ATTACAACGG GCGGAGTTTC TGTTGGAGAT TTTGACTATT 9660
 30 TACCTGAGAT TTATAAGGCT GTAAAGGCGG AAGTGTTATT TAATAAAGTA GCAATGCGTC 9720
 CTGGTAGCGT AACACAGGTT GCATTGTAG ATGGAAGTA TTTGTTGGa TTATCTGGAA 9780
 ATCCATCAGC TTGTTTTACA GGATTGAAC TATTTGTGAA nCCAGCTGTT AACATATGT 9840
 35 GTGGCGCACT AGAAGTCTTC CCGCAAATAA TTAAAGCAAC ATTAATGGAA GATTTTACCA 9900
 AGGCAAACCC ATTCACACGA TTTATACGTG CTAAAGCAAC GTTAACAAGT GCTGGAGCTA 9960
 CTGTAGTACC TTCAGGATTC AATAAATCAG GTGCGGTTGT AGCGATTGCA CATGCTAACT 10020
 40 GTATGGTCAT GTTACCAGGA GGGTCACGTG GTTTTAAAGC GGGGCATACA GTAGATATTA 10080
 TATTGACTGA ATCTGACGCT GCTGAAGAGG AACTTCTTTT ATGATTTTAC AAATTGTAGG 10140
 45 TTACAAAAG TCTGGTAAGA CAACATTGAT GAGGCATATT GTCTCTTTCT TAAAGTCACA 10200
 TGGTTATACA GTTGCTACTA TTAAACATCA TGGGCATGGT AAGGAAGATA TTCAATTACA 10260
 GGATTGAGC GTCGATCACA TGAAGCATTT TGAAGCGGG GCAGATCAAA GTATTGTACA 10320
 50 AGGTTTTCAA TATCAGCAAA CTGTAACAG TGTAGATAAT CAAAATCTTA CTCAAATTAT 10380
 TGA AAAATCT GTTACAATTG ACACCAATAT CGTATTAGTT GAAGGCTTTA AAAATGCTGA 10440

55

	GAATGTTTGT TATAGCATTA ATGTAAGGGA GCATGAAGAT TTTACAGCAT TTGAGCAATG	10560
	GTTATTAAAT AAAATTAAAA ATGATTGTGA TACACAATTA ACATAGAGGA TTGAAATGAA	10620
5	TGAAACAATT TGAAATCGTG ACAGAACCGA TACAAACAGA ACAATATCGT GAATTCACCTA	10680
	TAAATGAATA TCAAGGTGCA GTAGTTGTTT TTACCGGTCA TGTTCCGGAA TGGACTAAAG	10740
	GCGTCAAAAC GGAATATTTA GAATATGAAG CGTATATTCC AATGGCTGAA AAGAAATTGG	10800
10	CACAAATTGG AGATGAAATA AATGAAAAAT GGCCTGGAAC GATAACGAGT ATTGTTTCATA	10860
	GAATAGGGCC ATTACAAATT TCAGATATCG CTGTATTAAT TGCGGTTTCT TCACCGCATC	10920
	GTAAAGATGC CTATCGAGCA AATGAATATG CAATTGAGCG TATAAAAGAA ATTGTTCCGA	10980
15	TTTGGA AAAA AGAAATTTGG GAAGATGGTT CAAAATGGCA AGGGCATCAA AAAGGGAATT	11040
	ATGAAGAAGC AAAGAGGGAG GAATAAGAGA GATGAAGGTA CTTTACTTCG CAGAAATTAA	11100
20	AGATATATTA CAAAAGCAC AGGAAGATAT TGTGCTTGAA CAAGCATTGA CTGTACAACA	11160
	ATTTGAAGAT TTATTGTTTG AACGTTATCC GCAAATCAAT AATAAAAAGT TTCAAGTTGC	11220
	TGTAAATGAG GAATTTGTAC AAAAATCGGA TTTCATTCAA CCTAATGATA CTGTTGCATT	11280
25	AATTCCACCG GTTAGTGGAG GTTAAGGGAG CATGAAAGCA ATAATTCTTG CAGGTGGTCA	11340
	TTCAGTCCGA TTTGGTAAGC CCAAAGCTTT TGCGGAAGTG AACGGTGAGA CCTTTTATAG	11400
	TAGAGTAATT AAGACATTAG AATCAACAAA TATGTTCAAT GAAATTATTA TTAGTACAAA	11460
30	TGCGCAATTG GCAACGCAAT TTAAATATCC AAATGTTGTT ATAGATGATG AGAATCATAA	11520
	TGATAAAGGT CCATTAGCAG GAATTTATAC AATCATGAAG CAACATCCTG AAGAAGAATT	11580
	GTTTTTTGTC GTTTCTGTTG ATACACCAAT GATTACTGGT AAAGCTGTAA GCACGTTGTA	11640
35	TCAGTTTTTA GTTTCTCATC TTATTGAAAA TCATTTAGAT GTCGCAGCTT TTAAAGAAGA	11700
	TGGAGGTTTT ATTCCAACAA TTGCATTTTA TAGTCCGAAT GCATTAGGCG CTATAACTAA	11760
	AGCACTACAT TCTGATAATT ACAGTTTTAA AAATGTATAT CATGAATTAT CAACGGATTA	11820
40	TTTGATGTA AGGGATGTAG ATGCGCCCTC ATATTGGTAC AAAAATATAA ATTATCAGCA	11880
	TGATTTGGAC GCTTTAATTC AAAAATTGTA AGCTGTTAGG AGGTCCACAA ATGGTAGAAC	11940
45	AAATAAAAGA TAAACTAGGA CGTCCCATCC GTGACTTACG GTTATCTGTG ACAGATCGGT	12000
	GTAACCTTAG GTGTGATTAT TGCATGCCTA AAGAGGTATT TGGAGATGAT TTCGTATTTT	12060
	TACCTAAAAA TGAACCTTTA ACGTTTGATG AAATGGCTAG AATCGCTAAG GTATATGCAG	12120
50	AATTAGGTGT AAAAAAATA CGCATTACAG GTGGAGAACC ATTGATGCGA CGGGATTTAG	12180
	ATGTACTTAT AGCTAAATTA AATCAAATCG ATGGTATTGA AGATATTGGT TTGACTACAA	12240

55

EP 0 786 519 A2

	ATGTCAGTTT GGATGCTATT GATGATACGC TATTTCAATC AATCAATAAT CGTAATATTA	12360
	AAGCGACTAC GATTTTAGAA CAAATTGATT ACGCGACGTC TATTGGTTTG AATGTAAAAG	12420
5	TAAATGTTGT TATACAAAAA GGTATTAACG ATGATCAAAT CATACCAATG CTTGAATATT	12480
	TTAAAGATAA ACATATAGAG ATTCGATTTA TAGAATTTAT GGATGTTGGT AATGATAATG	12540
	GATGGGATTT CAGTAAAGTT GTAAGTAAAG ATGAAATGCT TACAATGATA GAGCAGCACT	12600
10	TTGAAATCGA TCCTGTAGAA CCAAATATT TTGGGGAAGT AGCAAATAT TATCGCCATA	12660
	AGGATAATGG TGTTCATTT GGTTCGATTA CAAGTGTTC ACAATCATTT TGTTCACAT	12720
	GTACACGCGC AAGGCTGTCA TCAGATGGGA AGTTTTACGG ATGTTTATTT GCAACTGTCTG	12780
15	ATGGATTTAA CGTTAAAGCG TTTATTCGTT CTGGCGTGAC CGACGAAGAA TTAAAGAAGC	12840
	AATTTAAAGC TTTATGGCAA ATAAGAGATG ATCGATATTC AGATGAGAGA ACTGCTCAAA	12900
20	CAGTTGCCAA TCGTCAACGT AAAAGATAA ACATGAATTA TATTGGTGGT TAATGTGTAG	12960
	GGACCACTAC ATATTAAATC ATTAGAGATG TTTAATATT TCTGTCTTAC TCCCTAAAT	13020
	ACAATATTAT TTATTAAAGT AAAACGGTC ATATCTATGC CAGATTTAAT AGAAATGATC	13080
25	GTTTTTAAAG TTTTACAAG TTGGCGGGC CCCAACACAG AAGCTGACAG AAAGTCAGCT	13140
	TACAATAATG TGCAAGTTGG CGGGCCCCA ACATAGAGAA TTTCAAAAAG AAATTCTACA	13200
	GACAATGCAA GTTGGGGAAC GGGGCCCCA CACAGAAGGT GACGAAAAGT CAGCATACAA	13260
30	TAATGTGCAA GTTGGCGGG CCCAACATA GAGAATTTCA AAAGAAATTC TACAGACAAT	13320
	GCAAGTTGGG GATCAACGAA ATAAATTTTA TGAGAATATC ATTTCTATCC CACTCTTAAG	13380
	AATCACTACA TAATAATCT TTAGTGGTTC TTTAATATT ATGTCACACT CCATGCCATT	13440
35	GAGTTGTAAT ATATCTTTT TAGGTATAAA TGTGTGCGAA TAAACAACAA GTTGTCCAAA	13500
	AGATAATAAT CTAAACAAGA TATAGCCAGC AATTTAATAT TTGTAATAGA TAAATGCTA	13560
	AGTTTGATAT ATAATAAAT TAAGTAATTG TATAATAATA TGAATTACAA ACATCTAAGA	13620
40	AGAAACATAG GAGGCATCAT ATTATGAGTA ATAAAGTTCA ACGTTTTATA GAAGCAGAAA	13680
	GGGAGTTAAG TCAGTTAAAG CACTGGTTAA AAACAACACA TAAGATTTC ATTGAAGAAT	13740
45	TTGTAGTCCT TTTTAAAGTG TATGAAGCTG AAAAGATTAG CGGTAAAGAA TTGAGGGATm	13800
	CATTACATTT TGAAATGCTA TGGGATACAA GTAAATCGA TGTGATTATC CGTAAATCT	13860
	ATAAAAAAGA GCTTATTTCT AAATTGCGTT CTGAAACGGA TGAAAGACAA GTATTCTATT	13920
50	TCTATAGTAC TTCTCAAAAG AAATTGTTAG ATAAATTAAC TAAAGAAATA GAAGTGTTAA	13980
	GCGTTACAAA CTAAAACTT aAAAagcaTG CCAATCTCTA TTCATCATAA TTGCGTCTTG	14040

55

EP 0 786 519 A2

GTTCATGGCA TTTCTAGTTA CATGACGTCC ATGAATTAAG AAGTAAACAA GCATAGTAAT 14160
 GATTGCTAAA GCGGCCATAA AGCCGAAGAT TTCATATAT GAAAACATAT GAGTAAATAA 14220
 5 CCCAAGGAAT GATGGACCGA AGCCGACACC TGCATCTAGA CCAACGTAAA AAGTAGATGT 14280
 CGCGATACCA TATTTAATCG GGGGTGAGAC TTTTATCGCA ATAGATTGCA TTGCAGATGA 14340
 TAAATTTCCA TACCCTAAAC CTAGGCAAGC ACCAGCAAGT AATATTAACC AGCTTTGATA 14400
 10 GCTTGAAATT AAGCATACAA ATGAAAGGAA AAGCATGATA AATGCTGGGT AGACAATAAT 14460
 ATTTTCATTT TTATCATCCA TCAATCTACC AGCAATAGGT CTAGTAATTA ACGATGCTAT 14520
 AGCATAGCAA ATAAAGAAAT AGCTTGCTGC AGTGACTAGG TGTCGCTCTA AAGCAAATGC 14580
 15 TTGTAAATAA GTTAGGATGG ACGCATAGGT AACGCCAATT AAAAGCATAA TTACAGCAAC 14640
 AGGAATGGCC TCTTTTGCAA TAAATTGATG AATACTAAAT CTTGGTTTAT CAATGACATT 14700
 AGTTTCAGTT TTGTTATTTG TTACTTCGAA ATCAACTTTT ATAAATAATG AGATAATGAG 14760
 20 TCCGAGTATG CCTAATATGA CACAAATAAT AAACAGTAAG TCAATTGCGT ATTTTGTAAT 14820
 AAGTAACATG CCTAGAAATG GGCCAATCGC TGTACCTAAT ACTAACTTA AGGAAAATAA 14880
 25 ACTGATGCCT TCACTTTTTC TATTAACAGG GGTAACGTAT GCCGCAATAG TACCTGTTGC 14940
 AGTTGTCACA ACTGCAGTTG CGATACCGTT TATGAGACGT ACAAAGATTA AAAAAGCTAA 15000
 AGATCCATCA ATAAATAAAA GTAATTGCGT GATAATTAAA GCAATTAAAC CAATAAATAA 15060
 30 TAATCGTTTA GGTCCrATTT sATTTACAAA TTTACCTGTA GCAAATCGA 15109

(2) INFORMATION FOR SEQ ID NO: 45:

(i) SEQUENCE CHARACTERISTICS:

35 (A) LENGTH: 9072 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 45:

GAGAGTCAAT GGCAAGAAGA ATATAAATAT TTGAGAGCGT TAATCTTTAA TGAAACAGAA 60
 TTAGAGGAAG CGTATAAATG GATGCATCCT TGTACACGT TGAATAATAA AAATGTAGTA 120
 45 CTTATCCATG GCTTCAAAAA TTATGTTGCA CTATTATTTT ATAAAGGTGC CATTTTGGAG 180
 GATAAATATC ATACACTCAT TCAACAGACT GAAAAGGTGC AAGCAGCTCG TCAGTTACGA 240
 TTTGAAAATT TAACAGAGAT TCAAGCACGT ACCGAAGAAA TTAAATATTA TCTAGCCGAA 300
 50 GCAATTAAAG CTGAAAAAGC TGGTAAAAAA GTTGAAATGA AGAAAACAGA GGAATATGTT 360

55

EP 0 786 519 A2

	AAATTAACGC CAGGCAGACA ACATCAATAT ATATATCATA TTGGACAAGC TAAACGCAGT	480
	GgAACCAAGAC AAAAGCGTGT TGAAAAGTAT ATTAACCAAA TACTAGAAGG TAAAGGGATG	540
5	CATGATAAGT AATTAATGAG TAAAGCATAC CGGTTATACA ACAACATACA AGATGACACG	600
	AAACAACCAA TGGCTCATGC TGTGGTGTGT TTTTITAGGT GTGTCTGTCA TGGGCAACAC	660
	TTTGACGTTG GAATTCGGTT ACAGGCTTGG GAGTAGAAAA TGTTAGCAAA AGGCAAGGGT	720
10	GTCTACAATG AATGATGAAG ATATTAAAAT ATAAGGATGA CTTTGTGAGT GCGGATGGG	780
	CGGTTGTCCG TCTGTAACAA TGGATGCGTG TGCATTATTA CAAAAATTCG ACTTTTGTA	840
	TAATATTTCA CATTTTCGAC ACTTTTTTGC TATAAAACAA CCAATTGAGC GATAATAAAT	900
15	TCGCTTTTAA AAAATATGAG TTATCTATTT AGTTGCCAAA GATAAAATAA TAATGTTTAA	960
	TAACATCATA TAGAGTATGT TAGTTTTTAA TGTCGAATAT ACGAATGTGc AAACAAAGTA	1020
20	ATCGGTAGAA ATTCAACATA CATAGCGCCG TTTACTGTTA AGTATTCACA TTACAGATGA	1080
	AAAATATAAA ATTCTACATA ATCAAGACCA TGATGTGTAC TTGTTTAACT TATGACTCTA	1140
	TTTGTTTAAc AATTGCGATA ATGGTCTTTT TATTTTATGC GTATCATTCG TCATATTTTT	1200
25	TATGAGGAAG GAGAAATGAT TATGTTAAGT ATTAAGCATT TAACGAAAAT TTATTCTGGT	1260
	AATAAAAAGG CAGTAGATGA CATCTCTTTA GATATTCAAT CTGGGGAATT TATCGCATTT	1320
	ATTGGAACCA GTGGAAGTGG CAAAACGACT GCTTTAAGAA TGATAAACCG TATGATTGAA	1380
30	GCGACAGAAG GACAAATTGA AATTGATGGT AAAGATGTTc GGAGTATGAA TCCTGTGAA	1440
	TTGCGTAGAA ATATTGGCTA TGTTATTCAA CAAATTGGCT TAATGCCTCA TATGACGATT	1500
	AAAGAGAATA TTGTGTGGT ACCCAAATTG TTGAAATGGA CTAAAGAGGA AAAGGATAAA	1560
35	CGTGCAAAGG AATTAATTAA ACTTGTGGAT TTACCGGAGT CATTTTTAGA GCGTTATCCA	1620
	GCAQAACTAT CAGGTGGGCA ACAACAACGT ATCGGTGTTG TAAGAGCACT TGCGGCCGAA	1680
	CAAGATATTA TTTTAATGGA TGAACCTTTT GGTGCATTGG ATCCTATTAC GAGAGATACG	1740
40	TTACAAGATT TAGTTAAAAC GTTACAACGA AAATTAGGCA AGACGTTTAT CTTTGTAACA	1800
	CATGATATGG ATGAAGCGAT TAAATTAGCA GACAAAATTT GTATTATGTC AGAAGGTAAG	1860
45	GTGGTGCAAT TTGATACGCC AGACAATATT TTAAGACATC CCGCAAATGA TTTTGTACGT	1920
	GATTTTATAG GACAAAATAG ACTGATTCAA GACCGTCCCA ATGACAAGAC TGTAGAAGGT	1980
	GTAATGATTA AACCAATCAC GATACAAGCA GAAGCAACAC TGAATGACGC CGTTCATATT	2040
50	ATGAGACAAA AACGTGTTGA TACTATTTTT GTAGTAGATA GTAATAACCA TTTACTAGGT	2100
	TTCTTAGACA TTGAAGATAT AAATCAGGGT ATACGTGGAC ACAAAGTTT ACGAGACACC	2160

55

EP 0 786 519 A2

	ATTTTAAAAA GAAACGTTAG GAATGTACCT GTCGTAGATG ATCAACAGCG TTTAGTAGGA	2280
	CTGATTACGC GTGCCAATGT TGTGATATT GTATATGACA CGATTGGGG CGATAGTGAG	2340
5	GATACAGTGC AAACAGAACA TGTGGGGGAA GACACTGCGT CCTCAAAAGT GCATGAGCAA	2400
	CACACTACTA ATGTCAAAGT ACGTGACATA GGAGATGATA AATCATGATT GAGTTCCTAC	2460
	ATGAACATGG TGGACAGTTG ATGTCGAAAA CACTGGAACA TTTCTATATT TCTATAGTGG	2520
10	CATTATTACT TGCCATCATT GTTGCACTAC CTATAGGCAT TTTATTATCA AAAACAAAGC	2580
	GAACTGCCAA TATTGTATTA ACTGTGGCAG GTGTCTTACA AACTATTCCA ACACTAGCTG	2640
	TACTTGCTAT TATGATACCG ATTTTGGTG TTGGTAAAC GCCTGCAATT GTAGCGCTAT	2700
15	TTATTTATGT ATTATTACCT ATTTTAAATA ACACGGTACT CGGTGTTCAA AATATTGATA	2760
	GCAACATTAA AGAAGCTGGA AAAAGTATGG GAATGACACA ATTTCAATTG ATGAAGGATG	2820
20	TTGAATTGCC GTTAGCATTG CCGCTTATCA TTGGTGGCAT TCGTTTGTC TCTGTGTATG	2880
	TAATTAGTTG GGCTACACTT GCAAGTTATG TAGGTGCGGG TGGATTAGGT GATTTCAATT	2940
	TCAATGGTTT AAATTTATAT GATCCACTGA TGATTGTAAC TGCAACGGTA CTCGTTACTG	3000
25	CACTAGCATT AGGTGTTGAT GCCTTATTAG CTTTAGTTGA AAAATGGGTA GTTCCCAAAG	3060
	GCTTAAAAGT ATCTGGATAA TTAGGAGGCT AAGATAATGA AGAAAATTAA ATATATACTT	3120
	GTCGTGTTTG TCTTATCGCT TACCGTATTA TCTGGATGTA GTTTGCCCGG ACTAGGTAGT	3180
30	AAGAGCACGA AAAATGATGT CAAAATTACA GCATTATCAA CAAGCGAATC GCAAATTATT	3240
	TCACATATGT TACGGTTGTT AATAGAGCAT GATACACACG GTAAGATAAA GCCAACATTA	3300
	GTAATAAATT TAGGGTCAAG TACGATTCAA CATAATGCCT TAATTAATGG GGATGCTAAT	3360
35	ATATCAGGTG TTAGATATAA TGGCACAGAT TTAACGGGAG CTTTGAAGGA AGCACCAATT	3420
	AAAAATCCTA AGAAAGCAAT GATAGCAACA CAACAAGGAT TTAAAAAGAA ATTTGATCAA	3480
	ACGTTTTTTG ATTCGTATGG TTTTGCGAAT ACGTATGCAT TCATGGTAAC GAAGGAAACC	3540
40	GCTAAAAAAT ATCATTTAGA GACAGTTTCA GATTTAGCAA AGCATAGTAA AGATTTACGT	3600
	TTAGGTATGG ATAGTTCATG GATGAATCGT AAAGGCGATG GCTATGAAGG ATTTAAAAAA	3660
45	GAGTATGGTT TTGACTTTGG TACAGTGAGA CCAATGCAAA TAGGTCTAGT CTACGACGCA	3720
	TTAAACTCAG AGAAGTTAGA CGTTGCATTA GGTATTCTA CAGATGGTCG AATTGCGGCG	3780
	TATGATTTGA AAGTACTTAA AGATGATAAA CAATTTTCC CACCTTATGC TCGAGTGCT	3840
50	GTTGCAACAA ATGAATTATT ACGGCAACAC CCAGAACTTA AAACGACGAT TAATAAGTTG	3900
	ACAGGAAAGA TTTCGACTTC AGAGATGCAA CGCTTGAATT ATGAAGCGGA TGGTAAAGGT	3960

55

EP 0 786 519 A2

	AAAGGTGGTC ATAAGTAATG GAAGGTAATT TATTACAGCA ATTATTCAAT TATTATGTTA	4080
	CGAACTTTGG TTATCTATGG GATTTATTTT TCAAACACTT ATTAATGTCT GTCTATGGTG	4140
5	TGCTGTTTGC AgCTTTAATT GGTATTCCAT TGGGAATCTT GCTTGCaAGA TACACAAAAC	4200
	TTTCTGGATT TGTAAATTACA ATTGCAAATA TAATTCAAAC AGTTCCAGTC ATTGCAATGT	4260
	TAGCTATTTT AATGTTAGTC ATGGGCTTAG GTTCAGAAAC AGTAGTTTAA ACAGTGTTTT	4320
10	TATATGCGTT ACTTCCAATT ATAAAAACA CTTATACTGG TATAGCTAGT GTTGATGCGA	4380
	ATATTAAAGGA TGCTGGCAAA GGTATGGGAA TGACACGCAA TCAAGTGCTA CGAATGATTG	4440
	AATTACCGTT ATCTGTTTCG GTTATTATCG GTGGCATTCT TATTGCCTTG GTTGTGCGA	4500
15	TAGGTGTTGT TGCCGTTGGA TCATTTATAG GAGCACCTAC GCTTGGTGAC ATTGTGATTC	4560
	GTGGTACAAA TGCGACGGAT GGCACAACGT TTATTTTAGC AGGTGCGATT CCGATTGCTA	4620
20	TCATTGCAAT CGTCATTGAT GTACTATTAA GATTTTTAGA AAAACGATTA GACCCAACAA	4680
	CACGACATCG TAAAAATCAA TCTAATCATC GGCCGCAAAG TATTAATATG TAATAGTAGA	4740
	AGATGTTTAT AATTTAGCGA TTTCGTTTCA TGATTTATAA AAAATGAGGC TACTCAAGGA	4800
25	GCTCAAATAA TCTTTGAGTA GCCTTTTTAT AGGTTGTGTT TGTATGCGTT TACACTAAAA	4860
	TAGCAATTAT TATCATGAAA GTTTTGGAT AAAAAGCGTT AATTATTGTA AAAATACTAA	4920
	AAAATGAGAT GTTTTATTTA TAATTTCTG CAAATTTATG ATATTGTTTC TTAATATATC	4980
30	ATATTAAAAA TTTGTTTTTC TTAAACATAG GAGGCTTATC TAATTCATGG ACACATCAAA	5040
	ACAATTTAGA GGTGACAACC GATTGCTTTT GGGTATCGTT TTAGGGGTTA TTACCTTTTG	5100
	GCTATTCGCG CAGTCACTTG TTAATCTTGT TGTCCCATTA CAATCAACAT ATAGTAGTGA	5160
35	CGTTGGAACG ATAAATATCG CTGTTAGCTT ATCTGCCTTA TTTGCTGGTT TGTTTATCGT	5220
	AGGTGCTGGT GATGTTGCTG ATAAATTGG TCGCGTCAA ATTACTTATG TAGGATTGAT	5280
	ATTAAATGTT GTAGGTTTAT TACTCATCAT CATTACACCT TTGCCAGCAT TTTAATTAT	5340
40	AGGTAGAATA ATTCAAGGTT TGTCTGCAGC ATGTATTATG CCATCAACAC TTGCTATTAT	5400
	TAACGAATAT TATATTGGTA CAAGAAGACA ACGTGCCTTA AGCTATTGGT CTATTGGTTC	5460
45	TTGGGGTGGT AGTGGTATTT GTACGTTGTT TGGTGGCTTA ATGGCTACAT ATATAGGTTG	5520
	GCGTTCAATA TTTGTTGTTT CAATTCATT AACATTATTA GCAATGTACT TAATCAAACA	5580
	TGCACCTGAG ACTAAAGCAG AACCAATCAA AGGTATGAAA GCAGAAGCTA AAAAGTTTGA	5640
50	CGTTATTGGT TTAGTCATTT TAGTAGTGAC GATGTTAAGT TTAAATGTAA TCATCACACA	5700
	GACGTCTCAT TTTGGTTTAG TTTACCGTT AATTCTAGGT TTAATTGTTG TGTTTATCTG	5760
55		

EP 0 786 519 A2

	AATTTTAAA AATAGAGGAT ACAGTGGTGC AACTATTTCA AACTTCTTAT TAAATGGTGT	5880
	AGCAGGTGGT GCACCTTATCG TTATTAACAC GTATTATCAA CAACAATTAG GATTTAATTC	5940
5	TTCGCAAACG GGTATATTTT CATTAACGTA TTTAATAACA GTGTTGTCAA TGATTCGTGT	6000
	AGGTGAAAAG ATTTTATCTC AACATGGTCC GAAGCGCCCA CTATTACTAG GAAGTGGCTT	6060
	TACAGTGATT GGGTTAATCT TATTGTCGTT AACATTTTTC CCAGAAGTGT GGTATATCAT	6120
10	ATCTAGTATA GTTGGATATT TATTGTTTGG TACTGGTTTA GGATTATATG CTACACCATC	6180
	AACTGATACA GCAGTTGCTA GTGCGCCAGA TGATAAGTCG GGTGTTGCTT CAGGTGTGTA	6240
	TAAAATGGCG TCATCATTAG GAAATGCATT TGGAGTAGCA GTATCTGGTA CGGTTTATAC	6300
15	TGTGTTAGCA GCTAATTTAA ATTTGAACTT AGGTGGTTTC ACAGGTATGA TGTTTAATGC	6360
	CTTGCTAGCA ATTGTTGCAT TTTAGTCAT TTTACTATTA GTTCCTAAAA ATCAAACGAA	6420
20	TTTGTAAGAC TGAAATGAAA GCAAGTTATT ATGTAGGGAT TTTAAAGGAA ATTTTGTGAA	6480
	AGTAAGTTTA TCATACACAC TTAATGTTGC GTATTGACGT TTAATGTTAG GTGTGTTCTT	6540
	TTATAGACGA TAAAAGCTGT GTGCATATTA AGCGAATGAT TTTCAAATTG ACGCTAATAT	6600
25	GCGAAAGTAG TATTTTAAA ATGAACAACA ACGATGAAGA GGGGTTTATA GGATGAAAAT	6660
	TGCAATTGCT GGATCGGGTG CATTAGGTAG TGGCTTTGGT GCCAACTAT TTCAAGCAGG	6720
	ATATGATGTC ACACCTATTG ACGGATATAC ATCTCATGTT GAAGCGGTGA AGCAACATGG	6780
30	ATTAAATATA ACGATTAATG GAGAGGCATT CGAGTTAAAC ATTCCGATGT ATCATTTTAA	6840
	TGATCAACCG GACGAAAGCA TTTACGATGT TGTCTTTCTA TTTCCAAAGT CTATGCAATT	6900
	AAAAGAAGTG ATGGAAGATA TGAAGCCACA TATTGATAAT GAAACGATCG TCGTATGTAC	6960
35	GATGAATGGT CTGAAGCATG AAGAAGTCAT TCGCGAGTAT GTTGCTCAAT CACAAATTGT	7020
	CAGAGGTGTT ACGACTTGGA CGGCAGGTCT TGAAAGCCCT GGACACAGTC ATTTACTTGG	7080
	TAGTGGACCA GTTGAAATAG GTGAACTAGT GGATGAAGGT AAAGAAAATG TTATAAAAGT	7140
40	TGCTGATTTA CTTAACGAAG CGGAATTGAA TGGTGTCAAT AGTAAAGATT TATACCAATC	7200
	GATTTGGAAA AAGATTGTG TTAATGGTAC GGCAATGCA TTAAGCACAG TGTTGGAGTG	7260
	TAATATGGCA TCGCTGAATG AAAGTAGTTA TGCGAAGTGT TTGATTTATA AATTAACGCA	7320
45	AGAAATAGTG CATGTAGCGA CGATTGATAA TGTTCATTTA AATGTTGATG AAGTATTGA	7380
	ATATTTAGTT GATTTAAATG AAaAAGTTGG TCGGCATTAT CCATCCATGT ATCAAGATTT	7440
50	AATTGTTAAT AATAGAAAAA CTGAAATTGA TTATATTAAT GCGCGAGTTG CAACATTAGG	7500
	TAAACAACGT CaTATTGAAG CGCCAGTCAA TCGCTTTATT ACTGATTTAA TTCATACTAA	7560

55

EP 0 786 519 A2

	CAATCACGTG ATATTACGGT CATTATTAAG ATTGAAATGT AATAAATAAA GAACAGCAGT	7680
	AAGGTACTTT CAAATTGAAA TGATCTTGGT GCTGTTTTTC TTGATTGATC TTCGTCATAA	7740
5	TTCAGATTTG TCATAGGcTA CGACATACTA TTAGTATTTA CTAGACAGTT TTTACGACGA	7800
	CACTTTGAAA AATTTTGAGG CAAATCATTT GGAAGTCTCA CGTGAATTTT GTAAACTCAT	7860
	CAAGCAAGTA ATTATATTAA AAAGACAAAT AGAGAAAAGG TGTTTATAAT GAGTAAAATT	7920
10	TTTGTAAGTG GTGCAACGGG CCTTATTGGC ATTAAATTAG TTCAAAGACT AAAAGAAGAG	7980
	GGGCATGAGG TTGCTGGTTT TACTACATCT GAGAATGGTC AACAAAAGCT AGCTGCTGTT	8040
	AATGTAAAAG CATATATTGG TGATATATTA AAAGCTGATA CTATTGATCA AGCGTTAGCA	8100
15	GATTTTAAAC CAGAAATCAT TATCAATCAA ATTACGGATT TAAAAAATGT TGATATGGCA	8160
	GCAAATACGA AAGTACGTAT TGAAGGTTCT AAAAACCTAA TTGATGCGGC GAAAAAGCAT	8220
20	GACGTTAAGA AAGTAATTGC CCAAAGTATT GCCTTTATGT ATGAACCTGG CGAAGGATTA	8280
	GCAAATGAGG AAACCTCACT TGATTTTAAC TCAACTGGCG ATAGAAAAGT AACGGTTGAT	8340
	GGTGTGGTTG GTTTAGAAGA AGAAACGGCT CGTATGGATG AATACGTTGT TTTACGTTTT	8400
25	GGCTGGTTAT ATGGCCCAGG TACTTGGTAC GGAAAAGATG GCATGATTTA TAATCAATTT	8460
	ATGGATGGTC AAGTGACACT TTCAGATGGC GTAACATCAT TTGTGCATCT TGATGATGCA	8520
	GTTGAAACAT CTATTCAAGC TATTCATTTT GAAAATGGTA TCTATAATGT AGCAGATGAT	8580
30	GCACCTGTTA AAGGTTCTGA ATTTGCAGAA TGGTATAAAG AACCACTTGG TGTGAACCA	8640
	AATATTGATA TTCAACCTGC GCAACCATTT GAACGTGGCG TAAGCAATGA GAAGTTTAAA	8700
	GCGCAAGGTG GTACTCTGAT TTATCAAACCT TGGAAAGATG GCATGAATCC AATTAAATAA	8760
35	TAATTTATCC GTTTAATATA CAAAGAATAA AGACTTGGTC GAATCGTGGA TGATATATTA	8820
	TCAAACGCAC GGCTCGAACA AGTCTTTTTT ATTATGTCTT CGTTATCTTT GTATGAAGGA	8880
	ATAACAGAAT TACAATTAAT GTACTGAATA ATGCAATTAA TGTTGTGATT AGTGCTAATT	8940
40	TAATTTCTAT TGGTAGCCAA GTCAGTACAA AAGACCAATT ATTGCTACCG AGAATGAGAT	9000
	ATGGTAATGC ATATAATATG AGCGCTAAAG CGATACATAT ACATAATGAT AACCAACTCA	9060
45	ATACAGCAAT CC	9072

(2) INFORMATION FOR SEQ ID NO: 46:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16826 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 46:

	GTGGAACAGC TGTAACATA TCATTTCTTT CAACATTTAT TGGGAAAATG TTAGCTACAT	60
5	TTCTATATCC GATTAATAAT GTAGTACTTT CATATATnTC TGTAATGAA AGTGACAATA	120
	TAAAGAAGCA ATATTTGaaa ACTAATCTAA TTGCTATAGC TGCCCTATGT TTAGTCATGA	180
	TTATATGTIA TCCAATTACA ATAATTATTG TCTCTTTACT GTATAACATT GATTCAAGTT	240
10	TATATTGAA GTTTATTATT TTAGGTAATA TAGGTGTTTT ATTCAATGCA GTGAGTATTA	300
	TGATCCAAAC TTAAATACA AAACACGCAT CAATAACATT ACAAGCGAAT TATATGACGC	360
	TTACACGAT TACATTTATA TTCATAACTA TTTTAATGAC AATTGCGTTT GGTCTAAATG	420
15	GATTCCTTTG GACAACGCTG TTCAGCAACA TTATTAAGTA TGTGATTTTA AATATTATAG	480
	GTTTAAAGTC TAAATTCATT AATAAAAAGG ACGTCGATTA GATGAGTGAA AAAAAGATTT	540
	TGATTTTATG TCAGTATTTT TATCCGGAAT ATGTATCTTC TGCGACGTTA CCAACTCAAT	600
20	TGGCGGAAGA TTTAATGCG AATCACATTA ATGTCGATGT CATGTGTGGA TGGCCATATG	660
	AATATAGTAA TCATAACAG GTTCTAAAA CCGAGATGCA TCGTGGTATT CGCATTGAC	720
	GTCTCAAGTA TTCGAGGTTT AATAACAAA GTAAGGTTGG AAGGATCATC AATTTCTTTA	780
25	GTTTATTTTC AAAATTCGTG ATTAATATAC CTAAATGTT GAAATATGAT CAGATTCTTG	840
	TTTACTCTAA TCCACCAATC TTGCCATTAA TACCAGACGT TTTACACAGA CTGCTTAAGA	900
30	AAAAATATTC TTTTGTGGTG TATGATATAG CACCTGATAA TGCGATTAG ACAGGTGCAA	960
	CTCGTCCAGG TAGCATGATT GATAAGCTGA TGCCTTACAT TAATAGACAT GTCTACAAGA	1020
	ATGCTGAAAA TGTCATTGTC CTGGTACGG AAATGAAAA CTACTTACTA AATCATCAA	1080
35	TTTCTAAAA TGCTGACAAT ATCCATGTGA TTCCTAACTG GTATGACATG CGTCAATTAC	1140
	AAGACAATCG TATCTATAAT GACACATTTA AAGCTTACCG TGAGCAATAC GACAAAATTT	1200
	TATTGTATAG CGGTAATATG GGGCAGTTAC AGGATATGGA GACACTTATC TCATTTTAA	1260
40	AATTAAATAA GGATCAGTCT CAAACGTAA CAATACTTTG TGGTCATGGT AAGAAATTTG	1320
	CAGATGTCAA AACGGCAATA GaAGACCATC GTATTGAAAA TGTTAAAATG TTTGAGTTTT	1380
	TAACAGGTAC AGACTATGCT GACGTATTAA AAATTGCGGA TGTATGTATT GCATCGCTGA	1440
45	TTAAAGAAGG CGTCGGTTTA GCGTGCCGA GCAAGAATTA TGGCTATCTT GCAGCTAAGA	1500
	AAGCGTTGGT ACTCATCATG GATAAGCAAT CTGATATCGT TCAACATGTT GAACAATATG	1560
50	ATGCGGGTAT CCAAATTGAT AATGGCGATG CACATGCCAT TTATACTTC ATCAACACTC	1620
	ACTCGAGTAA GGAATTGCAC GAGATGGGTG AGCGGCACA TCAACTGTTT AAAGATAAAT	1680

55

EP 0 786 519 A2

	AAGCGATTAT TCGATGTAGT GAGTTCAATA TATGGTTTAG TAGTTTAAAG TCCGATTCTG	1800
	TTAATTACAG CATTACTAAT TAAAATGGAA TCACCTGGAC CAGCCATTTT CAAACAAAAA	1860
5	AGACCGACGA TTAATAATGA ATTGTTTAAT ATTTATAAGT TTAGATCAAT GAAAATAGAC	1920
	ACACCTAATG TTGCAACTGA TTTAATGGAT TCAACATCGT ATATAACAAA GACAGGGAAG	1980
	GTCATTGCGTA AGACCTCTAT TGATGAATTG CCACAATTAT TGAATGTTTT AAAAGGAGAA	2040
10	ATGTCAATTG TAGGTCCTAG ACCAGCGCTT TATAATCAAT ACGAATTAAT CGAAAAACGT	2100
	ACAAAAGCGA ACGTGCATAC GATTAGACCA GGTGTGACAG GACTAGCTCA AGTGATGGGG	2160
	AGAGATGATA TCACTGATGA TCAAAAAGTA GCGTATGATC ATTATTACTT AACACATCAA	2220
15	TCTATGATGC TTGATATGTA TATCATATAT AAAACAATTA AAAATATCGT TACTTCAGAA	2280
	GGTGTGCATC ACTAATGAGA AAAAATATTT TAATTACAGG CGTACATGGA TATATCGGTA	2340
	ATGCTTTAAA AGATAAGCTT ATTGAACAAG GACATCAAGT AGATCAAATT AATGTTAGGA	2400
20	ATCAATTATG GAAGTCGACC TCGTTCAAAG ATTATGATGT TTTAATTCAT ACAGCAGCTT	2460
	TGGTTCACAA CAATTCACCT CAAGCAAGGC TATCTGATTA TATGCAAGTG AATATGTTGC	2520
25	TGACGAAACA ATTGGCACA AAGGCTAAAG CTGAAGACGT TAAACAATTT ATTTTTATGA	2580
	GTACTATGGC AGTTTATGGA AAAGAAGGTC ATGTTGGTAA ATCAGATCAA GTTGATACAC	2640
	AAACACCAAT GAACCTACG ACCAACTATG GTATTTCCAA AAAGTTCGCT GAACAAGCAT	2700
30	TACAAGAATT GATTAGTGAT TCGTTTAAAG TAGCAATTGT GAGACCACCA ATGATTTATG	2760
	GTGCACATTG CCCAGGAAAT TTCCAACGGT TAATGCAATT GTCAAAGCGA TTGCCAATCA	2820
	TTCCCAATAT TAACAATCAG CGCAGTGCAT TATATATTAA ACATCTGACA GCATTTATTG	2880
35	ATCAATTAAT ATCATTAGAA GTGACAGGTG TGTACCATCC TCAAGATAGT TTTTACTTTG	2940
	ATACATCGTC AGTAATGTAT GAAATACGTC GCCAATCACA TCGTAAAACG GTATTGATCA	3000
	ACATGCCTTC AATGCTAAAT AAGTATTTTA ATAAGTTGTC GGTCTTTAGA AAATTATTCTG	3060
40	GCAATTTAAT ATACAGCAAT ACGTTATATG AAAATAATAA TGCACTTGAA ATTATTCCTG	3120
	GAAAAATGTC ACTTGTTATT GCGGACATCA TGGATGAAAC GACAACCAA GATAAGGCAT	3180
	AAGTCATCTA TTAAATAAAA TCAACATACA AATCGTTTTA TTTGGAGGTT ATAGTATGAA	3240
45	GTTAACAGTA GTTGCTTAG GTTATATTGG TTTACCAACA TCAATTATGT TTGCAAAACA	3300
	TGGcGTCGAT GTGCTTGGTG TTGATATTAA TCAGCAAACG ATTGATAAGT TACAAAGTGG	3360
50	TCAAAATTAGT ATTGAAGAAC CTGGATTACA AGAGGTTTAT GAAGAGGTAC TGTCATCGGG	3420
	AAAATTGAAG GTATCTACAA CGCCAGATGC ATCTGATGTT TTTATCATTG CCGTTCGGAC	3480

55

	TAGTATTTTA TCATTTT TAG AAAAAGGAAA TACCATTATT GTAGAGTCGA CAATTGCGCC	3600
	TAAAACGATG GATGATTTTG TAAACCAGT CATTGAAAAT TTAGGGTTTA CAATAGGTGA	3660
5	AGATATTAT TTAGTGATT GTCCAGAACG TGTACTGCCA GGAAAAATTT TAGAAGAATT	3720
	AGTTCATAAC AATCGTATCA TTGGCGGTGT GACTGAAGCT TGTATTGAAG CGGGTAAACG	3780
	TGTCTATCGC ACATTCGTT AGGGAGAAAT GATTGAAACA GATGCACGTA CTGCTGAAAT	3840
10	GAGTAAGCTA ATGGAAAACA CATATAGAGA CGTGAACATT GCTTTAGCTA ATGAATTAAC	3900
	AAAAATTGTC AATAACTTAA ATATTAATGT ATTAGATGTG ATTGAAATGG CAAACAAACA	3960
	TCCGCGTGTT AACATCCATC AGCCTGGTCC AGGTGTAGGC GGTCATTGTT TAGCTGTTGA	4020
15	TCCGTACTTT ATTATTGCTA AAGACCCTGA AAATGCAAAG TTAATTCAAA CTGGACGTGA	4080
	AATTAATAAT TCAATGCCGG CCTATGTTGT TGATACAACG AAGCAAATCA TCAAAGTGTT	4140
	GAGCGGGAAT AAAGTCACAG TATTTGGTTT AACTTATAAA GGTGATGTTG ATGATATAAG	4200
20	AGAATCACCA GCATTTGATA TTTATGAGCT ATTAAATCAA GAACCAGACA TAGAAGTATG	4260
	TGCTTATGAT CCACATGTTG AATTAGATTT TGTGGAACAT GATATGTCAC ATGCTGTCAA	4320
25	AGACGCATCG CTAGTATTGA TTTTAAGTGA CCACTCAGAA TTTAAAAATT TATCGGACAG	4380
	TCATTTTGAT AAAATGAAGC ATAAAGTGAT TTTTGATACA AAAATGTTG TGAAATCATC	4440
	ATTTGAAGAT GTATCGTATT ATAATTATGG CAATATATTT AATTTTATCG ACAAATAAAA	4500
30	TGTGTCAAAC TAGGGCATACT ATGATTAAGG AAAGATAAGC TGTGATGTTT TTGAACTTCA	4560
	GAGAGGATAA TGTTATGAAA AAAATTATGG TTATTTTCGG TACGAGACCC GAAGCAATAA	4620
	AAATGGCACC ATTAGTAAAA GAAATTGATC ATAATGGGAA CTTTGAAGCG AACATTGTGA	4680
35	TTACAGCACA ACATAGAGAT ATGTTAGATA GTGTGTTAAG TATATTGAT ATTCAAGCTG	4740
	ATCATGATTT AAATATTATG CAAGATCAAC AACATTAGC AGGCCTTACG GCGAATGCAC	4800
	TTGCTAAACT TGATAGCATC ATTAATGAGG AACCAACCGA TATGATTTTA GTACATGGTG	4860
40	ATACTACAAC GACTTTTGTA GGAAGTTTGG CAGCATTTTA TCATCAAATT CCGGTGCGAC	4920
	ATGTAGAAGC TGGACTTCGA ACACATCAGA AATACTCACC ATTCCTGAA GAGTTAAATC	4980
	GAGTCATGGT AAGTAATATT GCTGAATTGA ATTTGCGCC AACAGTAATT GCAGCTAAAA	5040
45	ATTTACTTTT TGAAAACAAA GACAAAGAGC GTATCTTTAT TACTGGAAAT ACAGTTATTG	5100
	ACGCATTGTC AACAACAGTT CAAAATGATT TTGTTTCAAC GATTATTAAT AACATAAAG	5160
50	GCAAGAAAGT TGTTTTACTA ACAGCGCATC GTCGTGAAAA TATTGGGGAA CCGATGCATC	5220
	AGATTTTAA AGCAGTAAGA GATTTGGCAG ATGAATATAA AGATGTTGTC TTCATTTATC	5280

55

EP 0 786 519 A2

	GGATTGAATT AATTGAGCCA TTAGATGCGA TTGAGTTCCA TAATTTTACA AATCAATCGT	5400
	ACCTCGTGCT GACAGATTCT GGTGGTATTC AAGAGGAGGC TCCTACATTT GGAAAACCTG	5460
5	TGTTGGTATT AAGGAATCAT ACAGAGCGTC CCGAAGGCGT TGAGGCGGGA ACATCGAGAG	5520
	TAATTGGCAC AGATTATGAC AATATTGTTC GAAATGTGAA ACAATTGATT GAGGATGATG	5580
	AAGCGTATCA ACGTATGAGT CAAGCGAATA ATCCATATGG TGATGGACAA GCATCACGAC	5640
10	GTATTTGTGA AGCAATAGAA TATTATTTTG GATTGCGCAC AGACAAGCCG GATGAATTCG	5700
	TACCTTTACG TCACAAATAA TAAAAAACCC CTAATCATGA AGTTGGTTTA GACAACCAGC	5760
	GGTGACTAGG GGTTTTTAAT ATATTTATTT TTGATAGTGG TAGCCAATAT CATATTTGAA	5820
15	TACTTTATTT GATAATATTG GACTTTGCTG TCCATCGTCA TCACTTTTTA AACGTACATT	5880
	TTTATGAGCT TCTTTAAATA CATCGGAATT CAACCAATTA TTAAAGCTAT CTTCAGATTC	5940
20	CCAAATAGTT AAGATTTTAA CTTCGTCTGT ATCCTCGGTA TTTAATGTTT TAGTGACAAA	6000
	CATTTGTTGG AAGCCTTCAA TAGTTTCAAT ACCTTGCTA TTGTAAAAAC GTTCAATCGT	6060
	TTCTTCCGCA CTGCCTTTTT GTAATTGTAA TCTATTTTCT GCCATAAACA TGGGCAATCA	6120
25	CTCCTCTATT TTATGATTG ATTTGGGTAA TGTTTTTACA AATGTAAAGA GTACAGCGGT	6180
	TTGTATGATA ACCATTATGA TTAATCCTAC ACGGACTGCA AGAACATCCA CCAATATAAT	6240
	TGAAAAACCT ATTACAATGT ATAAGCTAAT TAAAATTTTA ATTTTCTGTT GTAGCGTGTA	6300
30	GCCTCGATGT AAATAAAAGT TTTCTACATA TTCTTTATAA ATTTTTTGAT TAATAAGCCA	6360
	ATTGTAAAAG CGATCTGAAC TTCGAGCAAA GCAAAAAACT GCTACGAGTA AAAAAGGGGT	6420
	CGTTGGCAGT AAAGGTAATA CGGCACCTGC AATACCAAGC GCTGTAAATA TTAAGCCAAT	6480
35	GACGATTAAA ATAAGTCGCA TTGAAAAAAC TCCATTCTAG TACTAATGCG CATGTAATAT	6540
	TGTTTTAGTA ATATAACTCA TGCTAAATAT AATGTGTATG ATAAGTGCAA TGACTCAGTA	6600
	AAATGAAACG ATGTTGAATT ATCCTTGTC AATTAAACGCA TTTTAAGCGC GACTTTCATA	6660
40	ACAACCAAAC TATTTAATGA GAATTATTCT CAAGTATTAT AGTTATATTA TGTGTTTTAT	6720
	TTTTGAAAAG TGCAATATGT TTTCGAAAAT AAGATTATTT TTATGTGCAA AAACGACGCA	6780
45	AAAGTTTTAA AAATGAGACT TCTGTGAGCT GATTATTTTA TAAAATGTAA ACGCTTACTA	6840
	TATAATGTGA ATCATATCGT TTAAAAGCAT TATTAAATAT GATGCTAAGA GATTTATATT	6900
	ATAGCCAATA AACAAAGGAG AGATAATATG GCAGTAAACG TTCGAGATTA TATTGCAGAG	6960
50	AATTATGTTT TATTATCAA TGGGGAATTT GTTAAAGGTA GCAGTGACGA AACAAATCGAA	7020
	GTGACTAATC CAGCAACTGG AGAAACACTA TCACATATTA CAAGAGCAAA AGATAAAGAT	7080

55.

EP 0 786 519 A2

TCAGAACGTG CACAAATGTT GCGTGATATT GGTGATAAAT TAATGGCACA AAAAGATAAA 7200
 ATTGCAATGA TTGAAACATT AAATAATGGT AAACCGATTG GTGAGACAAC AGCAATTGAT 7260
 5 ATTCCATTG CTGCAAGACA TTTCCATTAT TTCGCAAGTG TTATTGAAAC AGAAGAAGGT 7320
 ACAGTGAATG ATATCGATAA AGACACAATG AGTATCGTAC GACATGAGCC GATTGGCGTC 7380
 GTAGGTGCTG TTGTTGCTTG GAACTTCCCA ATGCTATTAG CTGCATGGAA GATTGCGCCA 7440
 10 gCCATTGCTG CAGGTAATAC AATTGTGATT CAACCTTCGT CTTCAACACC ATTAAGTTTA 7500
 TTGGAAGTTG CTAAAAATTT CCAAGAGGTA TTACCTAAAG GTGTTGTCAA TATACTAACG 7560
 GGTAAAGGTT CAGAATCAGG TAATGCAATT TTCAATCATG ATGGTGTAGA TAAATTATCA 7620
 15 TTTACGGGCT CAACTGATGT AGGTTATCAA GTTGCCGAAG CTGCAGCAA ACATCTAGTA 7680
 CCCGCTACAT TAGAGCTTGG TGGTAAAAGC GCCAATATCA TATTAGATGA TGCTAATTTA 7740
 GACCTTGCAg TTGAAGGTAT TCAGTTAGGT ATTTTATTCA ACCAAGGTGA AGTATGTAGT 7800
 20 GCAGGTTCTC GATTATTAGT TCATGAAAAA ATTTATGATC AATTGGTGCC ACGTTTACAA 7860
 GAGGCATTTT CAAATATTAA AGTTGGAAAT CCACAAGATG AAGCTACACA AATGGGTAGT 7920
 25 CAAACTGGTA AGGATCAATT AGATAAAATT CAATCATATA TTGATGCAGC AAAAGAATCA 7980
 GATGCACAAA TTTTAGCAGG CGGTCATCGC TTAAGTAAA ATGGATTAGA TAAAGGGTTC 8040
 TTCTTTGAGC CGACATTAAT TGctGTGCCA GACAATCATC ACAAATTAGC ACAAGAAGAA 8100
 30 ATATTTGGAC CAGTGTTAAC AGTGATTAAA GTGAAGGACG ATCAAGAAGC AATTGATATA 8160
 GCTAATGATT CTGAGTATGG TTTAGCAGGC GGTGTATTTT CTCAAATAT CACACGTGCA 8220
 TTAATATTG CTAAAGCTGT ACGTACAGGA CGTATTTGGA TTAACACTTA CAACCAAGTA 8280
 35 CCAGAAGGCG CACCATTGCG TGGTTATAAA AAATCAGGTA TCGGTCGAGA AACTTATAAA 8340
 GGTGCGTTAA GTAACATCA ACAAGTTAAA AATATTTATA TTGATACAAG CAATGCTTTA 8400
 AAAGGTTTGT ACTAGAATAA ATATCGTTTC TGAAGCGTGT TTGTAGGTCA GTCTAGCGGT 8460
 40 AAGTCTTAAC ATTAACGGC GTTGTTTAGA TTTTAAGCAA AACAAAATAT ATAGGAACAC 8520
 GTATCATGAT ATTAGGATAT AATGACTAAA ATAATAGCAG TAGGATGGTT TTTAATTGCA 8580
 AATCATCTTA CTGCTGTTTT TAATTATGCT AATTTGCGAT GCGGCTATTA TAAGGACAGA 8640
 45 GTTGTTTATT AATTATGGTG ATTTAGAAAT ATGAAGTTCA ATATGCAAAG TCATCGTTTG 8700
 TTTTAATATG CGGAACAATC ATTAAGTTA TTGCGATTTT TTGAACCTAA TGAACTAAA 8760
 50 CAATAAATTT GAGATACTTT TTTGTCATTT TTATGTAAT AACACAATAA TCTCGTACAT 8820
 TATTAAAATT TTCTATATGA TAGGAATAAA GCAAAGCGCG AGTGTGCTGT AAAAGTTTTT 8880

55

	GATGATGTAT AAATCATGGT TAATTACGGA AGCATTAAATA TTAACCTGAG AAGCTATAAA	9000
	GAATTATTTT TAAAAGCGAC AATATTAAAT ACGACGCATT TATTTAGGAG TGGCAAACGT	9060
5	ATGAATGGGA AAAAGGCGAA TACGATAAAC AGATACAAAT ATTTTCATCA TGTCAATCAT	9120
	CAAAAAATTC AACAAAGTTC TAAAAAGACG CTGTGGGCAT CACTAATCAT CACATTGTTA	9180
	TTTACAGTGA TTGAATTTGT CGGAGGTTTA GTATCTAATt CATTGGCATT ACTGTCAGAT	9240
10	TCATTTCATA TGCTTAGTGA TGTATTAGCA CTTGGTTTAT CTATGTTGGC CATTATTTTT	9300
	GCAAGTAAAA AGCCGACTGC ACGATACACA TTTGGATATT TAAGATTTGA GATATTAGCT	9360
	GCATTTTAA ATGGTTTAGC ATTAATTGTA ATTTCAATCT GGATTTTATA TGAAGCTATT	9420
15	GTACGTATTA TTTATCCGCA ACCAATTGAA AGTGGCATTa TGTTTATGAT TGCTAGTATT	9480
	GGTTTACTCG TCAATATTAT TTTGACTGTT ATCCTTGTAa GGTCTTTAAa ACAAGAAGAC	9540
	AATATCAATA TTCAAAGTGC ATTATGGCAT TTCATGGGAG ACTTATTGAA CTCTATTGGT	9600
20	GTCATCGTTG CAGTTGTATT GATTACTTTT ACAGGATGGC GCATCATCGA CCCAATCATT	9660
	AGTATTGTAA TTTCACTCAT CATTTTACGT GGTGGTTATA AAATTACGCG TAATGCgTGG	9720
25	tTAATTTTAA TGGAAAGTGT GCCTCAACAT TTGGATACTG ATCAAATTAT GGCAGATATT	9780
	AAAAACATAG ATGGCATATT AGATGTACAT GAATTTTCATT TGTGGAGTAT TACAACAGAG	9840
	CATTATTCAT TAAGTGCCCA TGTGTGTGTA GATAAAAAAT ATGAGGGTGA TGATTATCAA	9900
30	GCGATTGATC AAGTATCATC ATTGTTGAAA GAAAAATATG GCATTGCACA TTCAACGTTG	9960
	CAAATTGAAA ACTTGCAATT GAATCCATTA GATGAGCCAT ACTTCGACAA ATTAACATAA	10020
	ATAAAACATT GTAGCGCCTA AAACATTAAT CTATGTCATA GGCGCACGTT TCGTTTTATA	10080
35	CTTATGTTGC ATCATTTAAA TGATTTTCGT CAATTTCTTT GATGCTATCT ACATCTAACA	10140
	CGACATCTTT AGGTTTCAAA ATATGAATAT GTTTTTCATC ATTTGTATGT AAAATGCGTT	10200
	CTATGATGTA CCTTTGACCG GCCATTGTTT CTACAGCAAT CTTTTTGTTT CTAGCTAAAC	10260
40	TTGCTACGAC AGATTCTTTA TCCATAATGA TAGCCCCCTA TATATATGTT TATTTACTTA	10320
	TACCCTAACA TGATTTTTAT ACTCTTTGAA AATATATTTT ACAGAATTTT ATCTAAATAT	10380
	TTAAAAAAT ATCTTAATAT CCTTGTAATC CGATAAGAAT TATAGTAATA TTTTTTCAAC	10440
45	CATtGTTATA GGAGGTCTTA TTAATGACAT TATTTTTATT AGAAGCTAAC AATCTTGATT	10500
	TTGCATCAAC GAAAGAAGAA CTAGAAGCAA AGGCAGCATC ACTATCTACG AAGACAATTC	10560
50	CAACATTAAT TGAAGTACAA GCTACTGAAA ATTTAACTCA TGGTTATTTT ATTGTGGAAG	10620
	CAAATGACGA aGCAGAAGCT AAACAATTTT TAACAGAAGC AGATATTAGT ATTCAATTAG	10680

55

EP 0 786 519 A2

TTGATTACCT TGTAACCTGG AACATTCCGG AAGGCATTAC GATGGATCAA TATTTAGCAC 10800
 GTAAAAAGAA AAATTCTGTT CATTATGAAG AAGTGCCAGA AGTTGAATTT AAACGCACAT 10860
 5 ATGTATGTGA AGATATGTCT AAATGTATTT GTTTATACAA CGCACCTGAT GAAGAAGCGG 10920
 TACGTCGCGC GCGCAAAGCA GTTGATACAC CGATTGATGG CATCGAAAAA CTTTAATAAG 10980
 ACAACAAGTT GATGAGATAT ATGTATATAG GTTTGGCATG GATTTCGATT GCAGTTAATT 11040
 10 AGAATAGCTC AATGCTATAA ATGTAAGTAG TTGATATGAA GAACTAATG AACTAAATGC 11100
 AAGTATTGTC TAAACAATC ATTTTATTGA AATTTAGTAG AGCTGAAATT AATATAACGT 11160
 15 CGTTAATTGA ATAACGCTTA TGTATAAGA GCACTCATAC CAAACCATAA TCATCTATAG 11220
 ATATAACAAT TCACGATATA AGGGCTGTGT TTGGCATAGC CCTTTAGATA TACACTTAAT 11280
 TCCTATTAAT ATAGTAGGGA TTAAAAGGGG GCTTGTCTATG ATTAAAATTC AACAAATTACA 11340
 20 ACATCACTTT GGATCACATA AAGTAATTCA TAACTTTAAT TTGGACATTA GCAAGGGAGA 11400
 AATAGTCACT TTCATAGGGA AAAGTGGTTG CGGAAAGTCT ACTTTACTCA ATATTATCGG 11460
 TGGATTTATT CATCCATCGT CTGGTCGTGT CATTATTGAT AACGAAATTA AACAAACAGCC 11520
 25 ATCTCCAGAT TGTTTAATGC TATTTCAACA TCATAATTG CTGCCATGGA AAACGATTAA 11580
 TGACAACATT AGGATTGGAT TACAACAGAA AATTAGTGAT GAAGAGATTA ACGCACAGCT 11640
 TAAATTAGTT GATTTAGAAG ACAGGGGAAA GCATTTTCCC GAGCAACTGT CCGGGGGTAT 11700
 30 GAAACAACGT GTGGCACTAT GTCGAGCGCA TGTGCATAAG CCTAACGTTA TATTGATGGA 11760
 TGAGCCATTA GGTGCATTAG ATGCATTTAC ACGTTATAAA CTTCAGGATC AACTAGTGCA 11820
 aCTAAAACAT AAAACGCAAT CAACTATTAT TTTAGTGACG CATGACATTG ATGAAGCTAT 11880
 35 TTATCTTTCC GACCGCATTG TTCTGTTAGG TGAAGGGTGC AATATTATTT CTCAATATGA 11940
 AATTACAGCA TCACATCCAC GCAGTCGTAA TGATAGCCAC CTACTTAAGA TTCGTAATGA 12000
 AATTATGGAA ACATTTGCAT TGAATCATCA TCAAGTTGAA CCTGAATATT ATTTATAAGG 12060
 40 AGTGAGTGAC GATGAAAAGG TTAAGCATAA TCGTCATCAT TGGAACTTTT ATAATTACAG 12120
 GATGTGATTG GCAAAGGACG TCTAAAGAAC GGTCTAAAAA TGCCCAAAAT CAGCAAGTGA 12180
 TTAAAATTGG ATATTTGCCG ATTACACATT CAGCTAATTT GATGATGACT AAAAAATTAT 12240
 45 TATACAATA CAATCATCCG AAATATAAAC TAGAATTAGT TAAATTCAAT AATTGGCCAG 12300
 ATTTAATGGA CGCATTAAAC AGTGGTCGTA TTGATGGTGC ATCAACTTTA ATAGAGCTAG 12360
 50 CGATGAAATC AAAACAGAAG GGCTCAAATA TAAAGGCTGT GGCATTGGGC CATCATGAAG 12420
 GCAATGTCAT TATGGGACAA AAAGGTATGC ACTTAAATGA ATTTAATAAT AATGGCGATG 12480

55

EP 0 786 519 A2

	GTAAACAATT AAAGATTAAA CCGGGGCATT TTAGCTATCA TGAAATGTCG CCAGCAGAAA	12600
	TGCCAGCCGC ATTGAGTGAA CACAGAATTA CAGGGTATTC TGTAGCCGAA CCATTCGGTG	12660
5	CACTGGGTGA AAAGTTAGGC AAAGGTAAGA CTTTGAAACA TGGTGATGAC GTTATACCTG	12720
	ATGCGTATTG CTGTGTGCTA GTACTGAGAG GGAATTGCT TGATCAACAC AAGGATGTAG	12780
	CGCAAGcATT TGTACAAGAT TATAAAAAGT CTGGCTTTAA AATGAATGAT CGCAAGCAAA	12840
10	GTGTAGACAT TATGACGCAT CATTTTAAAC AAAGTCGTGA CGTTTTAACA CAGTCAGCGG	12900
	CATGGACATC CTATGGTGAT TTAACAATTA AGCCATCCGG CTATCAAGAA ATTACGACAT	12960
	TGGTAAAACA ACATCATTG TTTAATCCAC CTGCATATGA TGACTTTGTT GAACCGTCAT	13020
15	TGTATAAGGA GGCATCGCGT TCATGACACG TCCCACAAAT AACAAATTTA TATTACCTAT	13080
	TATCACATT ATTATTTCT TAGGCATTG GGAATGGTC ATTATTATTG GGCATTACCA	13140
	ACCTGTATTG TTACCGGGTC CTGCTCTTGT AGGAAAAAGT ATATGGTCTT TCATTGTTAC	13200
20	TGGAGAAATT TTCCAACATT TAGCAATTAG TTTATGGAGA TTTGTAGCGG GCTTTGTTGT	13260
	CGCATTGTTG GTTGCTATTC CATTGGGCTT CTTGCTTGGA AGGAATCGTT GGCTATACAA	13320
25	CGCTATCGAA CCGCTATTTT AATTGATTAG GCCGATATCT CCGATAGCAT GGGCACCATT	13380
	TGTTGTTCTA TGGTTTGGTA TTGGTAGTTT GCCAGCGATT GCGATTATTT TTATCGCTGC	13440
	TTTTTTCCCA ATTGTGTTCA ATACTAITAA AGGCGTTAGA GACATTGAAC CTCAATATTT	13500
30	AAAAATAGCA GCAAATTTAA ATTTAACTGG GTGGTCATTG TATCGCAATA TATTATTCC	13560
	CGGGGCATTT AAACAAATCA TGGCTGGGAT ACATATGGCG GTAGGAACAA GTTGGATATT	13620
	TTTAGTTTCT GGTGAAATGA TTGGTGACA ATCGGGATTA GGTTTTTTAA TCGTTGATGC	13680
35	ACGAAATATG TTGAACTTAG AAGATGTTTT AGCAGCAATA TTCTTTATCG GATTATTGG	13740
	TTTTATTATT GATCGATTCA TTAGTTATAT TGAGCAGTTT ATACTTAGAA GATTGTTGA	13800
	ATAAGGAGAG ATGATGATGA CTTTAGAAAC GCTTATCAAA GAACAATTAG ATCCTCATTT	13860
40	AGTAGAAGTT GATGAAGGGA CGTATTATCC GAGAACATTT ATTCAGCAAT TATTTGTAGA	13920
	TGGTTATTTT GGTGAGGCGG CATTGAGAAA AAATGCTGAA GTAATCGAAG CTGTATCGCA	13980
	GTCTTGTTTG ACAACAGGAT TTGTTTATG GTGCCAATTA GCTTTTTCAA CGTATTTAGA	14040
45	AAATGCCACG CAGCCACATT TAAATAATGA CTTACAACAG CAATTGTTAT CTGGAGAAAT	14100
	ATTAGGTGCT ACCGGATTGT CTAATCCGAT GAAGTCATTT AATGATTTAG AAAAGTTGAA	14160
	CCTTGAACAC ACTTATGTTG ATGGACAATT GGTGTGTCAGT GGACGTATGC CAGCTGTAAG	14220
50	TAATATTCAA GAAGACCATT ATTTTGGTGC GATTTGAAA CATGAATCAT CAGATGAATT	14280

55

EP 0 786 519 A2

	TTTAGGAGTC AACGGGTCAG CAACGTATCA AATCACATTG AATCAAGTCG TAGTGCCACA	14400
	ATCACAAATT ATCACGCATG ATGCGAAGCA GTTTGCGGCA ACTATTGCGC CGCAATTTAT	14460
5	TGCTTACCAA ATTCCAATAG GATTAGGCTC AATTAAAAGT TCTTTAGAGT TAATTGATGC	14520
	ATTTTCAAAT GTGCAAAACG GAATAAATCA ATATTTAGAG TATGATGTTG AAGCTTTTAA	14580
	AAAACGTTAT CGTCAACTTA GAGAGGAATA TTATGCAATA TTAGATGACG GTAACCTAAC	14640
10	TTCACATTTA AATGAATTAA TATCATTGAA GAAGGACATC GGCTATTTAT TGTTAGATGT	14700
	AAATCAAGCT TCTGTTGTCA ATGGTGGTTC TAGAGCGTAC ACACCATATT CGCCACAAGT	14760
	TCGCAAGTTA AAAGAAGGAT TCTTCTTCGC AGCATTGACA CCGACATTAA GACATTTAGG	14820
15	TAAACTTGAA GCAGAGTTGA AGGGGTAAGT GTGATAAGCT GATTTTTTGT TTAGATGCGT	14880
	TTGTTGAAAC ATTTTTTAAA ATAATATAAA TCTTAGTTA TAAACATTTT CTGTTAATTT	14940
20	GTTATATCCT TTTAACTAGG AAAATATACA TTTCGTAATA ATAATAATCG TTATCATTGA	15000
	AAAAGTGTTA ATAAGGTGTA TAATGAAAAT GTGAACAATT AATGAACCTC TTATTTTTAA	15060
	GAAGGTGAAT ACTATAGATA CGCATACTAA AGAACAACAA TTCTCGAATC TAGTAAGATC	15120
25	TTATCGTAAA GAATACGTGG GTAAAGGACC CAATAGTATT CGAGTGTCGT TTAAAGATAA	15180
	TTGGGCGATT GCACATATGA CAGGTGTTTT GAGTAAAGTT GAGAGTTTTT ACCTAAACGA	15240
	CAAACGCAAT GAATCGATGC TCCATTATAC ACGCACAGAG AAGATTAAAC AGATGTATAA	15300
30	AGAAATAGAT GTAAATGAGA TGGAAAGTCT TGTAGGCGCT AAGTTTGTA AATTATTTAC	15360
	AGATATTGAT TTGAATGATG ATGAAGTCAT TTCAATATTT GTTTTCGATA AGTCAATAGA	15420
	ATAAGTGTTG CTGGTGTAAG GTACACGGTG CTGTTTGCTA ACTTCGCTTT GAATTTAACA	15480
35	ATAATTCAAG GGGGTGGTAT GTCAAACGGT GCCGTTTTTT TGTCATATTT TTAACAACAG	15540
	CAACATGCAA CACGTACTTT AAGGAAGTCA AAATTTATCA TTTAGGAGAG ATGGATATGA	15600
	AAATCGTAGC ATTATTTCCA GAAGCAGTAG AAGGTCAAGA AAATCAATTA CTTAATACTA	15660
40	AAAAAGCATT AGGATTAAAA ACATTTTTAG AGGAAAGAGG ACATGAGTTC ATTATATTAG	15720
	CAGATAATGG TGAAGACTTA GATAAACATT TACCAGATAT GGATGTGATT ATTAGTGCGC	15780
	CATTTTATCC TGCATATATG ACTCGTGAAC GTATTGAAAA AGCACCGAAC TTGAAATTAG	15840
45	CAATTACAGC AGGTGTAGGA TCTGACCATG TAGATTTAGC GGCAGCAAGT GAACACAATA	15900
	TTGGTGTCGT TGAAGTTACA GGAAGTAATA CAGTTAGTGT GGCAGAACAT GCGGTTATGG	15960
50	ATTTATTAAT ACTTCTTAGA AACTATGAAG AAGGTCATCG TCAATCAGTA GAAGGTGAAT	16020
	GGAACCTGTC TCAAGTAGGT AATCATGCGC ATGAATTACA ACACAAAACA ATTGGTATTT	16080

55

TACAACACTA TGATCCAATC AATCAACAAG ACCATAAAATT GTCTAAATTT GTAAGCTTTG 16200
 ATGAACTTGT TTCAACAAGT GATGCGATTA CAATTCATGC ACCATTAACA CCAGAAACTG 16260
 5 ATAACCTATT TGATAAAGAT GTTTTAAGTC GTATGAAAAA ACACAGTTAT TTAGTGAATA 16320
 CTGCACGTGG TAAATTTGTA AATCGCGATG CGTTAGTTGA AGCGTTAgCA TCCGAGCATT 16380
 TACAAGGATA TGCTGGTGAT GTTTGGTATC CaCAACctGC ACCTGCTGAT CATCCATGGA 16440
 10 GAACAATGCC TAGAAATGCT ATGACGGTTC ACTATTCAGG TATGACTTTA GAAGCACAAA 16500
 AACGTATTGA AGATGGAGTT AAAGATATTT TAGAGCGTTT CTTCAATCAT GAACCTTTCC 16560
 AAGATAAAGA TATTATTGTT GCAAGTGGTC GTATTGCTAG TAAAAGTTAT ACAGCTAAAT 16620
 15 AGAATAAGGA TGCTGGGCTA GCGATTAAAG CTTTCAATTT TATATAAATG AATCATATAA 16680
 GCACTACTGC TGTTGTAAAG ATGGCAGTAG TTTTTTTATG ATTACATCTA AGTATAGTCA 16740
 CGGCTATGTT AGGACAATGA TTTAACATTT ACGCACATAT GTGTTCACTT ACGCAATTAT 16800
 20 TGAnAAATnT CATTCAATGTG GnAATC 16826

(2) INFORMATION FOR SEQ ID NO: 47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4012 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 47:

TTCAATGAGA GTAGTGGGCT GATGTTTAGC GATATCGCGT AAGATTAAACC ATTGGCCATA 60
 35 ATATATATTG TGTTTTTCTA AAATCGGCTC GGCTAATTTT AAATAGGGGC GATATATTGT 120
 TATpAACTA TTGAAAAATT CTTGTGATAG CATAGTGACA TCTCCTAAGA CAAAATAGTT 180
 AGCTTAGCTA mCCTTTTAC AACAAATAGTA ATTATAAAAC GGGAGCAATT AGAAATCAAT 240
 40 ATATAATTAT TAAGAGCAAA AATAATTATA CTTTGTTAAA ATAAGCGTAA TTACATGTAA 300
 ATAGGGGGAT ACTAATGATA TTGAAATTTG aTCACATCAT TCATTATATA GATCAGTTAG 360
 ATCGGTTTAG TTTTCCAGGA GATGTTATAA AATTACATTC AGGTGGGTAT CATCATAAAT 420
 45 ATGGAACATT CAATAAATTA GGTATATCA ATGAAATTA TATTGAGCTA CTAGATGTAG 480
 AAAATAATGA AAAGTTGAAA AAGATGGCAA AAACGATAGA mGGCGGAGTC GCTTTTGCTA 540
 CTCAAATTGT TCAAGAGAAG TATGAGCAAG GCTTTAAAAA TATTTGTTTG CGTACAAATG 600
 50 ATATAGAGGC AGTTAAAAAT AACTACAAA GTGAGCAGGT TGAAGTAGTA GGGCCGATTC 660

EP 0 786 519 A2

	ATCAGGATGA TGATGAAATT AAGCCACCAT TTTTATTCA ATGGGAAGAA AGTGATTCCA	780
	TGCGTACTAA AAAATTGCAA AAATATTTTC AAAACAATT TTCAATTGAA ACTGTTATTG	840
5	TGAAAAGTAA AAACCGATCA CAAACACTAT CGAATTGGTT GAAATGGTTT GATATGGACA	900
	TTGTAGAAGA GAATGACCAT TACACAGATT TGATTTTAAA AAATGATGAT ATTTATTTTA	960
	GAATTGAAGA TGGTAAAGTT TCAAAATATC ATTCGGTTAT CATAAAAGAC GCACAAGCAA	1020
10	CTTCACCATA TTCAATTTTT ATCAGAGGTG CTATTTATCG CTTTGAACCA TTAGTATAAA	1080
	TATACGTAAG TGCTATGAGC GAGAATGCCC ATATGAATAA TGACAAGCAC AATGGAAAGA	1140
	ATCGTTAATA TATTATTTAA TCGTGATGAC TTAATTAAAA TGAAAAAGAT TGATAATATA	1200
15	AATGTGAAAA AGATAAGTAT AACCCGTAAT CTAAAGTAAT TCACGGTGAG AGGTTGACTC	1260
	AATGTCATAA TGATTGCAAC GATGTTTATA ATTATAAATA GACTTAAAT AATTGTTCTC	1320
	ATATCAAACA CCTCATTGTT AGATTATTGA CATTATAACA GGGGTAATTG TATATGAACA	1380
20	TTAATGTGGT TGCTTGAGGA AAAATTTATT CATTGAAGTC AAGTTGGTTC ATTTTAGAAA	1440
	TGAATATCGT GTTAGATGAT GAAAGTATAT TGAAGTATAG GTAAC TAGTT GAAAAGTATT	1500
25	AATTGTACGA TAACATTAAA TTTAACACGA AACATAGATA TAAATGATT CACAATTAAA	1560
	ATGGGTAAAT TTGAACTGTC TAACTATTA ATTGGAGCAT GGACATTTC AAAATAAGAG	1620
	TTCAAATCTT ACACAAGCTC TGAATCGACA CTATAAGATA CAACTGTAT AATTAAAGGT	1680
30	ATTGTTAAAT AGAAGGAGAT ATCATAAATC ATGGAAAAGA TGCATATCAC TAATCAGGAA	1740
	CATGACGCAT TTGTTAAATC CCACCCAAAT GGAGATTTAT TACAATTAAC GAAATGGGCA	1800
	GAAACAAAGA AATTAAGTGG ATGGTACGCG CGAAGAATCG CTGTAGGTCG TGACGGTGAA	1860
35	GTTCAGGGTG TTGCGCAGTT ACTTTTAAA AAAGTACCTA AATTACCTTA TACGCTATGT	1920
	TATATTTTCG GTGGTTTTGT TGTGATTAT AGTAATAAAG AAGCGTTAAA TGCATTGTTA	1980
	GACAGTGCAA AAGAAATTGC TAAAGCTGAG AAAGCGTATG CAATTAAAT CGATCCTGAT	2040
40	GTTGAAGTTG ATAAAGGTAC AGATGCTTTG CAAAATTGA AAGCGCTTGG TTTTAAACAT	2100
	AAAGGATTTA AAGAAGGTTT ATCAAAGAC TACATCCAAC CACGTATGAC TATGATTACA	2160
	CCAATTGATA AAAATGATGA TGAGTTATTA AATAGTTTGG AACGCCGAAA TCGTTCAAAA	2220
45	GTGCGCTTGG CTTTAAAGCG AGGTACGACA GTAGAACGAT CTGATAGAGA AGGTTTAAAA	2280
	ACATTTGCTG AGTTAATGAA AATCACTGGG GAACGCGATG GCTTCTTAAC GCGTGATATT	2340
	AGTTACTTTG AAAATATTTA TGATGCGTTG CATGAAGATG GAGATGCTGA ACTATTTTAA	2400
50	GTAAGTTTGG ATCCAAAAGA AAATATAGCG AAAGTAAATC AAGAATTGAA TGAAC TTCAT	2460

55

CAAAATATGA TTAATGATGC GCAAAATAAA ATTGCTAAAA ATGAAGATTT AAAACGAGAC 2580
 CTAGAAGCTT TAGAAAAGGA ACATCCTGAA GGTATTTATC TTTCTGGTGC ACTATTAATG 2640
 5 TTTGCTGGCT CAAAATCATA TTAATTATAT GGTGCGTCTT CTAATGAATT TAGAGATTTT 2700
 TTACCAAATC ATCATATGCA GTATACGATG ATGAAGTATG CACGTGAACA TGGTGCAACA 2760
 ACTTACGATT TCGGTGGTAC AGATAATGAT CCAGATAAAG ACTCAGAACA TTATGGATTA 2820
 10 TGGGCATTTA AAAAAGTGTG GGGAACATAC TTAAGTGAAA AGATTGGTGA ATTTGATTAT 2880
 GTATTGAATC AGCCATTGTA CCAATTAATT GAGCAAGTTA AACC GCGTTT AACAAAAGCT 2940
 AAAATTAAAA TATCTCGTAA ATTA AACGA AAATAGATTA ACGACTGAAA TCTGAACGCT 3000
 15 CATAAGACTG TCATTTGCGT TCAGATTTTT TTACACAATA TAGAATGGTT GACTAAAATA 3060
 TTTTTGAATA TAGTGAAAGA GGGGGAAGTA CTGTGATAAA AAAGCTATTA CAATTTTCTT 3120
 TAGGGAATAA GTTTGCTATC TTTTAAATGG TTGTTTTAGT TGTCTTGGGC GGTGTATATG 3180
 20 CGAGTGCTAA ATTGAAATTA GAATTACTAC CAAATGTACA AAATCCAGTT ATTTCAAGTTA 3240
 CAACAACAAT GCCGGGTGCA ACGCCACAAA GTACCCAAGA TGAAATAAGT AGTAAAATTG 3300
 25 ACAATCAAGT AAGATCATTG GCATATGTGA AAAATGTTAA AACGCAATCC ATACAAAATG 3360
 CTTCAATTGT AACAGTTGAA TATGAAAATA ATACAGATAT GGATAAAGCA GAAGAACAGC 3420
 TTA AAAAGA AATCGATAAA ATTA AATTTA AAGATGAAGT TGGTCAACCA GAATTAAGAC 3480
 30 GTAATTCGAT GGATGCTTTT CCGGTTTTAG CATATTCATT TTCAAATAAA GAGAATGACT 3540
 TGAAAAAAGT AACGAAAGTA CTGAATGAAC AATTAATACC AAAATTGCAA ACGGTAGATG 3600
 GTGTGCAAAA TGC GCAATTA AATGGGCAGA CGAACCGTGA AATCACCCTT AAATTTAAGC 3660
 35 AAAATGAAGT TGAAAAATAT GGGTTGACTG CTGATGATGT AGAAACTAT CTAAAAACGG 3720
 CAACAGAAGC AACGCCACTT GGATTGTTCC AATTGGTGA TAAAGATAAT CAATTGTTGT 3780
 TGATGGTCAA TATCAATCTG TTGATGCTTT TAAAAACATA AATATTCCAT TAACGTGGCA 3840
 40 GGAGGACCAA GGCATCTCA TCCCAAAGTG ACCATAAACC AAATTCAGCC ATGTCAGACG 3900
 TTATCAGGCA TCACCACAGC AAATTCAAAG CGTCAGCnCC AATATATAGT GGATGCCGCA 3960
 nGAACTAGGG GTTTAGCGnT ATCAGTGGTG TGGCGACTCT ATTCTAAACG AT 4012
 45

(2) INFORMATION FOR SEQ ID NO: 48:

(1) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 7778 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 48:

5	CAATATAGGT CGCCGAGTTT CAACTaCATC AACTGGTTCA GTTACATTAG ATAATGCGCT	60
	AGGTGTAGGT GGCTATCCTA AAGGACGAAT TATTGAAATT TATGGTCCTG AAAGTTCTGG	120
	TAAGACAACA GTAGCGCTTC ACGCTATTGC TGAAGTACAA AGTAATGGCG GGGTGGCAGC	180
10	ATTTATCGAT GCTGAACATG CTTTAGATCC AGAATATGCT CAAGCATTAG GCGTAGATAT	240
	CGATAATTTA TATTTATCGC AACC GGATCA TGGTGAACAA GGTCTTGAAA TCGCCGAAGC	300
	ATTTGTTAGA AGTGGTGCAG TTGATATTGT AGTTGTAGAC TCAGTTGCTG CTTTAACACC	360
15	TAAAGCTGAA ATTGAAGGAG AAATGGGAGA CACTCACGTT GGTTTACAAG CTCGTTTAAT	420
	GTCACAAGCG TTACGTAAAC TTTCAGGTGC TATTTCTAAA TCAAATACAA CTGCTATTTT	480
	CATCAACCAA ATTCGTGAAA AAGTTGGTGT TATGTTCCGT AATCCAGAGA CTACACCAGG	540
20	TGGACGTGCA TTAATAATTCT ATAGTTCAGT AAGACTAGAA GTACGTCGTG CAGAACAGCT	600
	TAAACAAGGA CAAGAAATTG TAGGTAATAG AACTAAAATT AAAGTCGTTA AAAATAAAGT	660
	GGCACCACCA TTTAGAGTAG CTGAAGTTGA TATTATGTAT GGACAAGGTA TTTCTAAAGA	720
25	GGGTGAACCTT ATTGATTTAG GTGTTGAAAA CGACATCGTT GaTAAATCAG GAGCATGGTA	780
	TTCTTACAAT GGCGAACGAA TGGGTCAAGG TAAGGAAAAT GTTAAAATGT ACTTGAAAGA	840
	AAATCCACAA ATTAAAGAAG AAATTGATCG TAAATTGAGA GAAAAATTAG GTATATCTGA	900
30	TGGTGATGTT GAAGAAACAG AAGATGCACC AAAGTCATTA TTTGACGAAG AATAGTACAC	960
	AAATTTATAT CTATAGTTAA ACTTAGCAAA TATCCTTATA GGATTGATTG AAAGTGATAT	1020
	TCATCTCATA AAGCTAGAAT AATATCTAAC TTTATGGGAT AACTACAAA TCGAGACTAT	1080
35	AAGGTTTTTTT ATTTTATTTA TTATTACATT ATCAATAGTT TTATAATCGA GCTTCAAAAC	1140
	TTTA G AAAAAT AGTAGAAATA GCATTCAATA TAGTGCAAAA GTGCAAATTG ATAAC TTGAC	1200
	ACTTATCTCC TATAAACCGT ACAATTAATT TGTATGATTT ATATATAATT TCATAAAGTC	1260
40	ATATTGAATT TCATATAAAG AGCAAACCCT AGAAAAGGAG GTGTTTGTGT GAATTTATTA	1320
	AGCCTCCTAC TCATTTTGCT GGGGATCATT CTAGGAGTTG TTGGAGGGTA TGTGTTGCC	1380
	CGAAATTTGT TGCTTCAAAA GCAATCACAA GCTAGACAAA CTGCCGAAGA TATTGTAAAT	1440
45	CAAGCACATA AAGAAGCTGA CAATATCAAA AAAGAGAAAT TACTTGAGGC AAAAGAAGAA	1500
	AACCAAATCC TAAGAGAACA AACTGAAGCA GAACTACGAG AAAGACGTAG CGAACTTCAA	1560
50	AGACAAGAAA CCCGACTTCT TCAAAAAGAA GAAAACTTAG AGCGCAAATC TGATCTATTA	1620
	GATAAAAAAG ATGAGATTTT AGAGCAAAAA GAATCAAAAA TTGAAGAAAA ACAACAACAA	1680

55

EP 0 786 519 A2

	CGCATCTCCG	GTCTCACTCA	AGAAGAAGCT	ATTAATGAGC	AACTTCAAAG	AGTAGAGGAA	1800
	GAACTGTCAC	AAGATATTGC	AGTACTTGTT	AAAGAAAAAG	AAAAAGAAGC	TAAAGAAAAA	1860
5	GTTGATAAAA	CAGCAAAAGA	ATTATTAGCT	ACAGCAGTAC	AAAGATTAGC	AGCAGATCAC	1920
	ACAAGTGAAT	CAACGGTATC	AGTAGTTAAC	TTACCTAATG	ATGAGATGAA	AGGTCGAATC	1980
	ATTGACGAG	AAGGACGAAA	CATCCGCACA	CTTGAACTT	TAACTGGCAT	TGATTTAATT	2040
10	ATTGATGACA	CACCAGAAGC	GGTTATATTA	TCTGGTTTTG	ATCCAATAAG	AAGAGAAATT	2100
	GCTAGAACAG	CACTTGTTAA	CTTAGTATCT	GATGGACGTA	TTCATCCAGG	TAGAATTGAA	2160
	GATATGGTCG	AAAAAGCTAG	AAAAGAAGTA	GACGATATTA	TTAGAGAAGC	AGGTGAACAA	2220
15	GCTACATTTG	AAGTGAACGC	ACATAATATG	CATCCTGACT	TAGTAAAAAT	TGTAGGGCGT	2280
	TTAAACTATC	GTACGAGTTA	CGGTCAAAT	GTACTTAAAC	ATTCAATTGA	AGTTGCGCAT	2340
20	CTTGCTAGTA	TGTTAGCTGC	TGAGCTAGGC	GAAGATGAGA	CATTAGCGAA	ACGAGCTGGA	2400
	CTTTTACATG	ATGTTGGTAA	AGCAATTGAT	CATGAAGTAG	AAGGTAGTCA	TGTTGAAATC	2460
	GGTGTAGAAT	TAGCGAAAAA	ATATGGTGAA	AATGAAACAG	TTATTAATGC	AATCCATTCT	2520
25	CATCATGGTG	ATGTTGAACC	TACATCTATT	ATATCTATCC	TTGTTGCTGC	TGCAGATGCA	2580
	TTGTCTGCGG	CTCGTCCAGG	TGCAAGAAAA	GAAACATTAG	AGAATTATAT	TCGTCGATTA	2640
	GAACGTTTAG	AAACGTTATC	AGAAAGTTAT	GATGGTGTAG	AAAAAGCATT	TGCGATTGAG	2700
30	GCAGGTAGAG	AAATCCGAGT	GATTGTATCT	CCTGAAGAAA	TTGATGATTT	AAAATCTTAT	2760
	CGATTGGCTA	GAGATATTAA	AAATCAGATT	GAAGATGAAT	TACAATATCC	TGGTCATATC	2820
	AAGGTGACAG	TTGTTTCGAGA	GAAGTAGAGCA	GTAGAATATG	CGAAATAATT	TTTGTCTCCC	2880
35	TCACAAATTA	GTGAGGGAGC	TTTTTTAAGT	TGTAGTCTTA	ATCTAGTTAG	ACAGCACTTT	2940
	ATCGGTAATA	ACTATATTAA	ACAGTAGTTA	TTTGAAAGTA	AGACGGACCT	TATATTAAAT	3000
	AAGAAGTTAT	TGCTTTTAAAT	AAAATGTTT	TAGGCTTCGT	AATTACTATA	TTTATATTAT	3060
40	GTAAACCTAT	AAAGATGATT	GGTTTTCTAT	CCAATAAAAA	AGAAGAGAAG	ATGTAACACA	3120
	TCTTCTCTTC	YGCAATATTA	ATTAGGATTT	ATTTCTAAGT	TGAGTTATTT	TAATTGTAAA	3180
	TCTGTTTTCT	TTAATTCTTT	TATAACTTCT	GCAGTATCAT	AACAATTTGT	TGCAATTGTT	3240
45	GAATATCTCT	CTGCTAAACG	ATATGCATTA	ATGTAAAGCT	TTAAACTTTC	TTTAGCTATA	3300
	TCCTCTGCAT	CTTCGAATTT	TGATGGGTTA	GACATAACCA	CTAATTCTGC	AAATTTTCT	3360
	GGATCAATAT	TAATAGACAT	GTATTTATTT	ACAACCTCTA	TTTATTTTGA	TGTCTTAATA	3420
50	CTAACATATT	GAAGTTTTCA	GACAAAGTAA	TGTCTCTCTA	TAATTGAAGA	AAAATAATTC	3480
55							

EP 0 786 519 A2

	GGATGAACAA AACATGAGAA TAATGTTTAT AGGGGATATC GTAGGTAAAA TTGGACGAGA	3600
	CGCAATTGAA ACGTACATAC CTCAACTGAA GCAAAAGTAT AAACCAACAG TTACAATTGT	3660
5	AAATGCTGAA AATGCAGCAC ATGGTAAAGG TTTGACTGAA AAAATATATA AACAAATTACT	3720
	AAGAAATGGT GTAGATTTCA TGACTATGGG TAATCACACA TATGGTCAAC GTGAAATTTA	3780
	TGATTTTATA GATGAAGCAA AACGACTAGT AAGACCAGCG AATTTTCCGG ATGAAGCGCC	3840
10	GGGAATTGGT ATGAGATTTA TACAAATTAA TGATATTAAA CTTGCAGTTA TTAATCTGCA	3900
	AGGAAGAGCG TTTATGCCAG ATATTGATGA TCCTTTTAAA AAGGCAGATC AATTAGTCAA	3960
	GGAAGCACAA GAACAACTC CGTTTATATT TGTTGATTTT CATGCAGAAA CAACTTCTGA	4020
15	AAAGTATGCA ATGGGATGGC ATTTAGATGG TAGASTAGCG CTGTTGTTGG AACGCATACA	4080
	CACATTCAAA CAGCAGATGA ACGTATTTTA CCAAAGGGGA CAGGGTATAT AACGGATGTT	4140
	GGTATGACAG GTTTTATGA TGGCATTTTA GGAATAAATA AAACAGAGGT AATTGAGCGT	4200
20	TTTATCACTA GTTTGCCACA AAGACATGTT GTTCCAAATG AAGGTAGAAG TGTATTATCT	4260
	GGTGTGTGTA TTGATTTAGA CAAAGAAGGT AAAACAAAGC ACATCGAACG TATATTGATA	4320
25	AATGATGACC ATCCATTTTC AACATTTTAA AATTACGTAA GTAAACATTC GAATTGGACC	4380
	CTATCGTCCA TTAGTATGAA TTAAATATAG TACCACTGTT TACATAGTAA ATCGGTGGTT	4440
	CTTTTTGTGA TCATTTAATA TGAAATATAT CCATAGGAGG CATATAACTA TGAAACCACA	4500
30	ATTATCGTGG AAAGTTGGCG GTCAACAAGG CGAAGGTATT GAATCAACTG GGGAAATCTT	4560
	CGCTACGGCT ATGAATAGAA AAGGATATTA TTTATATGGA TATAGACATT TTTCAAGTCG	4620
	TATCAAAGGT GGACATACGA ATAATAAAAT TAGAGTTTCT ACGACGCCTG TTCATGCAAT	4680
35	TAGTGATGAT TTAGATATTT TGATTGCATT TGACCAAGAA ACAATTGATG TTAACCATCA	4740
	TGAAATGAGA GAAGACAGTA TTATTTTATC TGATGCCAAG GCTAAACCTG TGAAaCCAGA	4800
	AGGATGTCAT GCACAGCTTA TTGAATTACC TTTTACAGCA ACCGCTAAAG AATTAGGTAC	4860
40	AGCATTAATG AAAACATGG TTGCAATAGG TGCTACTAGC GCATTGATGA ATTTGAATAC	4920
	AAATACATTT GAAGAACTTA TTAATAATAT GTTTTCTAAA AAAGGTGACA AGGTAGTTGA	4980
	AGTCAATATC CAAGCATTAA ACGAAGGTTA TCAATTAATG CAATCTCGCT TACCTGAAAT	5040
45	CTACGGGGAC TTTGAATTAG AGTCAACAGA TGCACTACCA CATCTATATA TGATTGGTAA	5100
	CGATGCCATT GGATTAGGTG CAATTGCTGC AGGTTCACAA TTTATGGCGG CATATCCTAT	5160
	TACACCTGCG TCTGAAGTTA TGAATATAT GATTGCCAAT ATATCTAAAG TAAACGGAGC	5220
50	GGTTATTCAA ACAGAAGATG AAATTGCTGC TGTAATATG GCTATTGGTG CAAATTATGG	5280

55

	TGGATTATCT	GGTATGACTG	AAACGCCATT	AGTCATTATT	AATACCCAAC	GAGGTGGACC	5400
5	TTCTACTGGA	TTACCTACGA	AACAAGAACA	GTCAGATTTA	ATGCAAATGA	TTTATGGTAC	5460
	ACATGGTGAT	ATTCCAAAAA	TTGTTGTAGC	ACCAACAGAT	GCAGAAGATG	CATTTTATTT	5520
	AACTATGGAA	GCATTTAATT	TAGCAGAACA	ATATCAATGC	CCTGTTATAG	TTCTAAGTGA	5580
10	TTTGCAATTA	TCTTTAGGTA	AACAACTGT	TGAAAAATTA	GATTATAATC	GTATTGAAAT	5640
	TAAACGTGGT	GAAATCATT	AATCTGATAT	TGAACGTGAA	GAAGATGATA	AAGGTTATTT	5700
	CAAGCGTTAT	GCGTtAACAT	CCGATGGTGT	TTCTCCTAGA	CCTATCCCCG	GTGTTAAAGG	5760
15	AGGTATTCAT	CATATAACTG	GTGTGGAAaCa	CAATGAAGAA	GGTAAACCTA	GTGAATCTGC	5820
	GTCAAATAGA	CAACAACAAA	TGGA AAAACG	AATGCGTAAA	ATTGAGCAGT	TACTAATTGA	5880
	ATCGCCAGTA	GAAGCTAACT	TACAACATGA	GGATGCAGAT	ATTCTTTATA	TCGGTTTTAT	5940
20	TTCTACAAAA	GGTGCAATTC	AAGAAGGTAG	TAACCGTTTG	AATCAACAAG	GCATAAAAGT	6000
	TAACACTATA	CAAATTAGAC	AATTGCATCC	ATTCCCAACA	AGCGTTATTC	AAGATGCAGT	6060
25	TAATAAAGCG	AAGAAAGTCG	TTGTAGTGGA	GCACAATTAT	CAAGGACAAT	TGGCTAGTAT	6120
	TATAAAAATG	AATGTCAATA	TTCATGATAA	GATTGAAAAT	TATACAAAGT	ATGATGGGAC	6180
	ACCTTTCCTA	CCACATGAAA	TCGAAGAAAA	AGGC AAAATA	ATTGCTACTG	AAATAAAGGA	6240
30	GATGGTATAG	ATGGCGACAT	TTAAAGATTT	TAGAAATAAT	GTTAAGCCTA	ACTGGTGCCC	6300
	CGGATGTGGC	GATTTCTCAG	TACAAGCTGC	AATTCAAAAA	GCAGCCGCAA	ATATAGGGTT	6360
	AGAACCTGAA	GAAGTAGCTA	TCATCACC GG	TATAGGATGT	TCTGGCCGTC	TTTCAGGATA	6420
35	TATTAATTCT	TATGGCGTTC	ATTCTATTCA	CGGACGTGCA	TTACCTTTAG	CTCAAGGTGT	6480
	AAAAATGGCG	AATAAAGATT	TAACTGTTAT	TGCATCGGGA	GGAGATGGTG	ATGTTTATGC	6540
40	TATAGGTATG	GGGCATACAA	TCCATGCTTT	AAGAAGAAAT	ATGAACATGA	CGTATATAGT	6600
	CATGGATAAT	CAAATTTATG	GTTTGACAAA	GGGACAAACA	TCGCCGTCAT	CAGCAGTAGG	6660
	ATTTGTTACT	AAAACAACGC	CAAAAGGTAA	TATAGAAAAA	AATGTTGCGC	CTTTAGAATT	6720
45	AGTATTATCA	TCTGGTGCCA	CATTTGTAGC	CCAAGGTTTT	TCAAGCGATA	TTAAAGGATT	6780
	AACAAAATA	ATTGAAGATG	CAATTAATCA	TGATGGATTT	TCATTCGTTA	ATGTCTTTTC	6840
	ACCATGTGTG	ACTTATAATA	AAATTAACAC	ATACGATTGG	TTTaAAGAAC	ATTTAACAAG	6900
50	TGTTGATGac	ATTGAAAATT	ATGATTCTAC	AGATAAACAA	TTAGCGACTA	AAACTGTTAT	6960
	TGAACATGAA	TCTTTAGTAA	CTGGTATTGT	TTATCaAGAT	AAAGAAACAC	CATCATATGA	7020
55	ATCtCAAATT	AAAGAGTTAG	ATGATmCACC	ACTTGCTAAA	AGAGATATCa	AAATTaCTGA	7080

TGTATTTATA ACAGATCCAT TTATGCTACT CAGTTTTTTTA CTATTACAAA AAATAAAGGA 7200
 GTTTTTTAAAA ATGAAAGACA CATTAATGAG TATACAAATA ATTCCTAAAA CACCAAACAA 7260
 5 TGACAATGTT ATACCTTACG TAGACGAGGC GATTAAAAATA ATTGACGAAT CTGGTTTGCA 7320
 TTTTAGAGTA GGTCCGTTAG AAACGACAGT ACAAGGAAAT ATGAATGAAT GTTTAATTTT 7380
 10 AATACAATCA TTAAATGAAC GAATGGTGGA ACTTGAATGT CCAAGTATTA TTAGCCAAGT 7440
 TAAGTTTTAT CATGTGCCAG ATGGCATCAC TATTGAAACT TTAAGTGAAG AATATGATGA 7500
 ATAACATTAA AAGTGAAGTA AACTGGATTT GAATTGGCTT GTTAGAGATG ACGTATAACT 7560
 15 TTAAGTGTTC TTGCACTTTA TAGTTAAATT TAATATAATT ATTAAATGAT ACGGGCAAAT 7620
 AGAAAGGATT TTGTAAAGTG AACGAAGAAC AAAGAAAAGC AAGTTCTGTA GATGTTTTAG 7680
 CTGAGAGAGA TAAGAAAGCA GAAAAAGATT ATAGTAAATA TTTGAACAT GTTTATCAGC 7740
 20 CGCCTAATTT AAAAGCAAGC GCAAAAAAAG AGGTTAAA 7778

(2) INFORMATION FOR SEQ ID NO: 49:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1128 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 49:

AGATGAAGTT GTTACgAAAA TTGCGTACGC TGTTTCAGAA CATGTCAAAA TAGAAACAGG 60
 35 TAATCCATTC TTTCAAACAT CACATAGTGG TTGTGCGACG GGCGGATCCT GTAATTGTTC 120
 ATTATAAAAA ACATCGAGTC AGAAAAAGGT GGTATTGAA cCACTAACTA GCATCTGACT 180
 40 CGATTTTTTT ATTTATTTCGG GATTGTTTGT TTGAATTGTT GTGCTAAATC TGGTCGATCT 240
 GTCACAATCG TGTGTGCACC TTTTGGTAT AAATCATTCA TCAGATTTAT ACTATTTACG 300
 CCATAATAGC CTGGAATGAT ATTCATATCA TTTAACCATT TGATAAAACG AGATGAAGTC 360
 45 AAATCAATGC CTTTAAAATG AGTAGGCATT TGGAACGTTT GTGCTAATGG TTGGTAGTAC 420
 CTACCACCTA ATAAATGATA TTTTAAAAAT GCTTCTGTAA CTTCTGTG GCTAGCACCA 480
 ATTGCGACGG ATCCTTGTGC AATTTTATTA AAACGAACGA TTTGTTCTTT ATAAAAACTT 540
 50 GTCACAAGAA CGCGGTCAAA TGCTTGATTT TCTGCAATTG TATCAAACAT AATTGTGGT 600
 GCGATTGAGC CTTCATAGGA TTCAGGAGCA TCTTTTAAGT CTACGTTTAT ATACATATCA 660
 55 GGATATTGCT TCAGCAACTc ATCGAAGGTT AGTATAGCTG TGTGTGCATG ACCACGATAT 720

	AATGTATGGG CACTAACTTT TCCAGAGCCG TTCGTCGTTT TATCAACAGT TGCATCATGA	840
	AAAACGATAA GCTGTTGATC TTTTGTGAGT CTCACATCTG TTTCAAAGCC ATCAACGCCT	900
5	AATTGTTTAG CATAGTCAAA TGCAAGTTGC GTTTGCTCTG GTCTTAAAGC CATAACCACCG	960
	CGATGCGCAA ATATATATGG TGCATTGCCT TTGAAAAAAG CAGGGATGGT TTGCTTTTTA	1020
10	GTAATCACTT TATTTTTATT GATCATTAAT AGACTACTTA AAAATCCAGC ACCGACTAGT	1080
	ACCGCATTTA AAATGTTTCT GTTTACnTTT TTCATAAAAA ATTCCTCC	1128

(2) INFORMATION FOR SEQ ID NO: 50:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 6252 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 50:

25	CAAGCAAACA ATCGTCGATA AAATTGCTAA AATAATAAAA GTAATTCGAA CTTTCATCAT	60
	GATCATCCTT TGTTTATAGA GTCAATATAA GTATGGAATA TGTTAGGTAT ATAGTCAAAT	120
	GCGTCAACTA ATGGGAATTT TGGCATAGAT AGAGAATTTA AGGCAATTAA AAAGGCATCA	180
30	AACAGTAATA TGCTGCTTGA TGCCCAAATG ATGACTTTAG CTAAATTGAT TAGTCACTTT	240
	TAAAGATAAA GAATTGTCAT GAATTAAAAC TCATGTAATG ATGTGTTACA TTTGCAATG	300
	ATGGCTTTCA GTTATTTATC GATAACATCA CTCTTGATAC CTTTAGATTT TAAGAAATCT	360
35	TTAATTTTAT CTTGTTGCTT TTTATTAACA TCACCGGCAT ATTTTGTGG CACGTCGACA	420
	ACATTGATTT TATTTTGCGG TTGATAGCTA AGCTTTTCAA TATCTTCATC AACATTGGCG	480
40	ATTGTACTAT TTAAAGCTTT GAAGTAATTC ATCATTAATT CAACGGGTTT CTTATATTCT	540
	TTAGGAATAT TGTTTTAGT GACAAATTC TTGAAATGCA AATCGTTTTT AACAGCTAAG	600
	TTAGATAAGT GGCTAAGTGT TTCTGCTTGT TTTTCAGTCA CTTTTGTTG ACTGTCAATT	660
45	TGTTTATCTA GTTTATGTTG CATAATATAT TTGTTATCAA GTATATCGCT ATTTACAGAC	720
	AAATACTTTT CTATAGCTTG CTTCATCTCT GCATCACTAA TATCACTATT TTTCTTATCT	780
	GAGTTAAAGA TATCTTTTGT tTCTAATTTT TTAGCGCTTT TAGGTGCATG GATGCCAGTA	840
50	CTTGATGAT GATCTTCGTT ATCAGATTGA TCGGACGCGC AACCTGTAAG AATTAATGTC	900
	GATGCTAAAA ATGTAAGTAG TAGTAATCTC TTTTTCATAA TGTAATATAA CTCCTTAGTT	960
55	TATCTTTAAT TGAAAAATA TGTATTCATG TTTAATAGAG TAACATTGAA TTAGTTTGGA	1020

	TCTATCAATA ATGCATCATT TTGGACGTTG TTAAGGATAG CTTTATCTAT AAATAACTGC	1140
5	ATAATTGGTT GTACTAATTT AGACGTAGGT ATCGTACGTA AAAGCATAAT AATTTTCGTTT	1200
	ACATACTTTT CTTTCTCAAT ATCATTTTTC ATATTGATTT GTTTGCGAGA GGTACATACT	1260
	TTAAGCATT A TCGCACATCT CGTTGTATAT ATTAAGTTTA TCATAACATG ATTTTATGTC	1320
10	GGGATAAAAA AATAACAGCA TCTTAACAAA TGTAAGATAC TGTCAGTGAA ATGAATGAAA	1380
	CTTTAGTTTC TGaTAATATA GTCAAAGGCA TTTAATGCTG CATTTGCACC AGCGCCCATT	1440
	GAAATGATAA TTTGTTTGTT CTTCTGATCT GTGACATCGC CAGCAGCAAA TATTCCAGGA	1500
15	ACATTGCTAT TATTGTTACG ATCAATCACA ATTTACCAC GTTCGTTTAA TTCAACAGCA	1560
	TCGTTTAAAC ATGATGTGTT TGGAAGTAAA CCAATTTGAA CAAAGATACC ATCTAAGTTA	1620
	AGTAGATGTT CTTGCGCGGT GTTCATGTCT TCGTAACGTA TACCTGTAAC ATGGTCTTCT	1680
20	CCGACAACTT CAGTAGTTTT GGCATTTGTT TTGATATCAA CATTTGATAA AGAACGTAAA	1740
	CGATCTTGTA ACACGTTGTC TGCTTTTAAT TCGCTAGCGA ATTCGAATAA TGTAACATGA	1800
25	TTAACGATAC CAGCAAGGTC AATTGCTGCT TCAACCCCAG AGTTACCGCC ACCGATAACT	1860
	GCTACGTCTT TATTTTCAAA TAGAGGTCCG TCACAGTGAG GGCAGAATGC AACACCTTTA	1920
	TTAATCAATT GCTCTTCACC TGGAATGTTT AGCTTACGCC AACCTGCACC AGTAGCAATA	1980
30	ATGACTGTTT TACTTTCTAA GACAGCACCG TTTTCTAACG TAACTTTAAT TGCTTCGTCA	2040
	GTCTTTTCGA TATCTGTAGC ACGTATACCT GTCATTGCAT CAATGTCATA TTGATCAATG	2100
	TGCGCTGCTA AGTTAGAAGA AAATTCAGAA CCAGTTGTTT CTTTAACAGT AATGAAGTTC	2160
35	TCAATACCAG CAGTATCATT AACTTGGCCA CCGATACGAT CAGCAACTAT ACCAGTACGT	2220
	AAACCTTTAC GTGCTGTGTA AATCGCTGCA CTACCACTAG CAGGACCACC ACCAACGATT	2280
40	AAGACATCAT AAGGTTCTTT ATTTTCAAAC TCAGATGCAT CTGCCGTACT GCCTAGTTTC	2340
	GAAAGAATAT CTTGGATTGT CATACGACCA TTGCCAAATT CTTGCCATT TAAAAAGACA	2400
	GCAGGGACTG CCATGATGTT TTCAGATTCT TCACGGAACA CTGCACCATC AATCATAGAA	2460
45	TGCGTGATGT TAGGGTTGAT CACACTCATT AAGTTAAGTG CTGGAACGAC ATCAGGACAT	2520
	TTTTGACACG TTAAACTAAT GAATGTTTCA AAATGGAATG AACCTTCTAA TTTTTTAATT	2580
	TGGTCAATGA TTGACTGTTT TTCTTTAGGT GCACGACCAC TAACCTGTAA AATTGCTAAA	2640
50	ACAAGTGAGT TAAACTCGTG ACCTAATGGA ATACCTGCAA ATGTTACACC TGTTTCTTCG	2700
	CCAGGACGAT TGA CTGAGAA ACTTGGTGTA CGTTTTAAAG ATTTTTCAGA AAGAGATAGT	2760
55	CTAGGTGACA TATCAGTAAT TTCTGTCAAC AAATCTTTAA GTTCTTTGGA TTTATCATCT	2820

EP 0 786 519 A2

	TGTTGTTTTA AATCAGCATT AAGCATGGTT GTAATGCCTC CTTAGATTTT ACCTACTAAA	2940
	TCTAAACCAG GTTGCAATGT TTTAGCGCCT TCTTCCCAT TAGCTGGGCA TACTTCGCCA	3000
5	GGGTTTTTAC GAACATATTG AGCTGCTTTG ATTTTGTGAG CTAATGTACT AGCGTCACGG	3060
	CCAATTCGGT CAGCGTTAAT TTCAGATGCT TGTACAACAC CGTCTGGGTC GATAATGAAT	3120
10	GTACCACGTT GAGCTAAACC AGTAGCTTCA TCTAATACAT CAAAATTACG AGTGATTGTT	3180
	TGTGATGGGT CACCAATCAT AGTGTAAGTG ATTTTGCTAA TTGCATCTGA ATGGTCATGC	3240
	CATGCTTTGT GTACGAAGTG AGTATCAGTT GATACTGAGA ATACATTTAC GCCTAATTTT	3300
15	TGTAATTCTT CATATTGGTT TTGTAAGTCT TCTAATTCAG TTGGACAAAC GAATGAGAAG	3360
	TCAGCAGGAT AGAAGCATAC TACGCTCCAA GAACCTTTTA AATCTTCTTG TGTAAC TTCT	3420
	TTAAATTGAT CTTTTTTTGG ATCGAAACT TCGCTGTAA ATGGTAAGAT TTCTTTGTTA	3480
20	ATTAATGACA TAAATATCTT CCTCCTAAGA ATTAAAGTAT GAATTAGAAC TATCAATTGA	3540
	TTGCGCTTAA TTATAATAAT TCTAATCTCT TAGTTAGCAT TATTACATTT TGATCCAGAA	3600
25	TAGTCAACTG GATAACTTTG TAAAGTGAAT GATTACTTTT AAAATAAAGA AAGATAATAT	3660
	AAAGTGCTTT GATAATGGAT TTGTAGTTG ATGATTTAAA AGGTTGTGTC TATATTTAAT	3720
	ATCTTGATTT TAATGTAAAA AATGTAAAAA AAGAAGATTT GTATTCTCAA CTAAGTCAAC	3780
30	CTTATTGATA ATGGTATGAG AATATTTGTT CGAGATGGAT GAAGGTAATG AGTGAGAAAC	3840
	TGGATTTTTA AAGTATGAGA CAATATTTTA AAAAGTTCAA TTATTAAC TTATAAGCAAAT	3900
	AATTGCTATA AAAAAGTTTG GACGTGTACA ATTGCAATAT GAAGATTTTA AATTAATTGT	3960
35	AAAGTATCGA GGAGTGGGTA ACGTGTGAGA ACATGTATAT AATCTTGTGA AAAAGCATCA	4020
	TTCTGTTAGA AAATTTAAGA ATAAACCTTT AAGTGAAGAC GTTGTTAAGA AATTGGTAGA	4080
40	AGCTGGACAA AGCGCTTCGA CGTCAAGTTT CCTGCAAGCA TACTCAATTA TTGGTATCGA	4140
	CGATGAGAAG ATTAAAGAAA ATTTACGAGA AGTTTCTGGA CAACCTTATG TTGTAGAAAA	4200
	TGGCTATTTA TTCGTCTTTG TTATTGATTA TTATCGTCAT CATTAGTTG ATCAACATGC	4260
45	TGAAACTGAT ATGGAAAATG CATATGGTTC AACGGAAGGT TTGCTAGTAG GTGCAATCGA	4320
	TGCAGCATTG GTTGCCGAAA ATATTGCGGT AACTGCTGAA GATATGGGGT ATGGCATTGT	4380
	CTTTT TAGGA TCATTAAGAA ATGATGTTGA ACGCGTTTGA GAAATTTTAG ACTTACCTGA	4440
50	CTATGTCTTC CCGGTATTTG GTATGGCAGT AGGGGAACCC GCAGATGACG AAAATGGTGC	4500
	AGCCAAGCCA CGCTTACCAT TTGACCATGT CTTCCATCAT AATAAGTATC ATGCTGATAA	4560
55	GGAAACACAG TATGCACAAA TGGCAGATTA CGACCAGACA ATCAGCGAGT ACTATGATCA	4620

EP 0 786 519 A2

	CAAAGCAAGA TTAGATATGT TAGAACAATT GCAAAAATCA GGCTTAATAC AGCGATAgCA	4740
	AGATACCAAA ATAACCCGCC CCCCTCTAGC TTAAAATGAT AAGTATAGCT AGAGGGGGCG	4800
5	GGTATTTCTT GCAATGAATT AGTGTGAAGT TAATGCAGCA TTATCATTTG AATCGAAAGT	4860
	ATCTTTATCC CAATGTTTAG TTAACCTGGC GGTACCTGTA CCAGCTAGCA TTGAATCGTT	4920
10	CACGTTTAAT GCTGTTCTAC CCATGTCAAT CAATGGTTCA ACGGAGATGA GCACGCCGGC	4980
	TAAAGCGACT GGCAAGTTTA ACGTTGACAA CACCAATATG GATGCAAATG TAGCCCCGCC	5040
	ACCGACGCCA GCAACGCCGA ATGAACTAAT AATCAGCACA GCGATTAAAG TTACAATAAA	5100
15	TTGTAAATCA ATTTCTACAT TAGCGACGGG TGCGACCATA ATTGCAAGCA TGGCAGGGTA	5160
	AATGCCTGCA CAACCATTTT GTCCAATCGA CAATCCAAAT GTCGCAGCGA AATTGGCAAT	5220
	ACCTTCTGGC ACGCCTAGAC GTCTTGTTTG TGTTTGTACA TTCAATGGTA AGGCACCCGC	5280
20	GCTTGAGCGT GATGTGAATG CAAAGATTAA TACTTCCAAA GTCTTTTTTAA CATAGCGAAT	5340
	TGGGCTAATA CCTAACAGGC TTAAAATAAT TAAGTGAATG ATATACATCG TAATTAATGC	5400
	AGCGTACGAT GCGATTAAAGA ATTTTCCTAA AGTCCAAATG GCGCCAAAGT CACTTGTCGA	5460
25	TAATGTGTTG GCCATAATTG CTAATACACC GTATGGCGTT AAACGTAAGA CGAACGTCAC	5520
	AATCGCCATT ACTAGTGAAT AGATAGCGTC AATCGCACGC TTAAGCAATT CACCATGATC	5580
30	AGGTTGTTTG CGTnTACGCG TAAATAAGCA AATCCTATAA ACGAAGCAAA TATCAGCACA	5640
	GCAATCGTGG aAGTTGCAGG TTGTCCaGTG AAATCTAAGA ATGGATTTTT AGGCAATAAT	5700
	TCCAAAATTT GTTGTGGTAA CGTATGTGCT GTTAAATCTT TCGCTTGTTT AGCAATTTTCG	5760
35	CTTCCACGTG CTTGTTTACG GTTACCAAGG TTAATTGTTG ATGCATCTAA ACCAAACACC	5820
	AAGGCATACA CAACACCAAC AATCGCAGCA ATGGTGACAG TGCCAATTAA AAAGATAAAA	5880
	ATGASACTAC CAATTTTAGC AAACTTTTCT CCGATTTGAA TTTTAGTGAA TGCAGCTACA	5940
40	ATAGAAATGA AAATTAAAGG CATAACAATC ATTTGCAACA ATGCAACGTA ACCTTGTCGG	6000
	ACAATGTTGA ACCAGTCACT TGTTGATGTA ATAACATTTC AATGTGTGCC ATAAATAAGA	6060
45	TGCAATAACA CACCGAATAC TATACCAATC CCTAAAGCTG TAAACACACG TTTCGCAAAA	6120
	GATATATGTT TGCGAGCCAT CATGTGCAAT ATTACGATGA AAATCACCAA TACAATAATA	6180
	TTAATCAGTG TAAGAAAAGC ATTCATGAAC GTCACCTCCT AAATTTTTGA ATATAATTCC	6240
50	GACTAGTATG CT	6252

(2) INFORMATION FOR SEQ ID NO: 51:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6730 base pairs

(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 51:

	ATCAAATCnC AAAATATTTA TTAATnAnAA GGGGATTATC CaTGTgAGAA ACAAAGTAAT	60
10	GCTCTTTTTT TACCTCTTGT GGGTTGAAAA aTGGATCATC AGAGATAGAC TTCTTCTTTT	120
	TCGAAGATGA CATTTGATAC TTTAATCTTC TAAAACCATA ACTTGTGCGCA TCAAAAATGC	180
	CTTCTGTAC AAGTAAAATC AAAAATATGC TAATAAAAAT AATTAATGAA ACATAAAACA	240
15	ATATATTTAA ATATGTAATG ATAGTATGGC TATTAAAAAG CCATATAATA AACGTTAATA	300
	TTGGCGTTAT TAGTGCCATT CCAAGCCATT TTTTCAACAT TTGATCACTC CCACTTATAG	360
	AAACTCTTA CGCATAGTTT ACATTAAAT CAGACATTGA GGAATGATT TTTAATTCT	420
20	TCAGCTTTAT TGAAATTCTA AAATCAATCA TTCTTCATTA GTTTAAAGCA AAAAAATATT	480
	GATATATAGT AAATATTGTA TATATAATAT TAGTTAAGAT TTCaGAAAAT TTTGAAGGGA	540
25	ATGGAAATTT AGAAATCGGA ATTTGTTAGA GGAGGGGATT AGATGGGGAA ATATATTTTC	600
	AAACGATTTA TTTATATGCT TATTTCTTTA TTTATTATTA TTACAATTAC ATTTTCTTA	660
	ATGAAATTAA TGCCAGGTTT GCCATTTAAT GATGCTAAAT TAAATGCTGA ACAAAAAGAA	720
30	ATTTTAAATG AAAAAATATGG ATTAAATGAT CCTGtAGCTA CGCagTATTT ACATTATTTA	780
	AAAAATGTTG TTACAGGCGA TTTTGGAAT TCATTCCAGT ATCATAATCA ACCTGTGTGG	840
	GATTTGATTA AACCGAGACT ACTACCTTCT TTTGAAATGG GTCTTACAGC AATGTTCaTC	900
35	GGTGTGATAC TGGGACTTAT TTTAGGTGTT GCAGCAGCTA CTAACAAAA TTCTTGGGTT	960
	GACTATACAA CTACAGTTAT TTCAGTTATT GCAGTATCTG TACCATCTTT TGTACTTGCT	1020
40	GTACTTTTAC AATATGTATT TGCAGTTAAA TTAAGATGGT TCCCAGTAGC TGGATGGGAA	1080
	GGTTTTTCGA CCGCGGTATT ACCGTCACCT GCATTATCTG CAGCTGTTTT AGCAACTGTC	1140
	GCCAGATACA TAAGAGCAGA GATGATAGAG GTATTAAGTT CAGACTATAT TTTATTAGCG	1200
45	AGAGCTAAAG GTAATTCGAC AATGCGTGTA CTTTTGGAC ATGCACTTAG AAATGCTTTA	1260
	ATTCCAATTA TTACAATTAT CGTTCCCATG TTAGCAAGTA TTTAACAGG CACTTTAACA	1320
	ATTGAAAATA TTTTGGAGT TCCTGGATTA GGGATCAAT TCGTACGTTT AATTACAACA	1380
50	AATGATTCT CAGTAATCAT GGCAATCACA CTATTATTTA GCACACTGTT TATCGTTTCT	1440
	ATTTTATTG TAGATATTTT GTACGGTGTG ATAGATCCAC GAATTCGTGT TCCaAGgAGG	1500
55	TAAAAATAA TGGCTGAAAA TAAAAACAAT TTGTCGATTA ACGACGATCA TTCTAATGCA	1560

	TGAATCAGGA ACCTGAAATG CAACGAGAAA GCAAAAACCTT TTGGCAAGAT GCTTGGGCTC	1680
5	AGTTAAAACG AAATAAGTTA GCTGTTGTGCG GTATGATAGG TTTAATTATC ATTGTAATAT	1740
	TTGCTTTTAT CGGTCCAGTT ATAAATAAAC ATGATTATGC TGAACAAAAT GTAGAACATA	1800
	GAAATCTTCC GGCAAAAATA CCTGTATTAG ACAAAGTTCC ATTTTACCT TTTGATGGTA	1860
10	AAGATGCAGA TGGCAAGGAT GCTTATAAAG CAGCAAATGC TAAAGAAAAT TATTGGTTTG	1920
	GTACTGATCA GTTGGGTCGA GATTTATGGA CAAGAACATG GAAAGGTGCT CAAATTTTCAT	1980
	TGTTTATCGG TGTTGTTGCA GCGATGTTAG ATATTTTAT TGGTGTGTA TATGGTGCGA	2040
15	TTTCTGGATT CTTCGGTGA CGTGTGATA CGATTATGCA ACGTATACTT GAAGTCATAG	2100
	CATCTATTCC GAATTTAATT GTCGTAATTT TATTTGTATT AATTTTGA CCATCCATTT	2160
	GGACAATTAT ATTGGCTATG TCTATCACAG GCTGGTTAGG CATGAGCAGA GTTGTACGTG	2220
20	GAGAATTTT AAAATTAAAA AATCAAGAGT TTGTCATGGC TTCGAAAACA TTGGGGGCTT	2280
	CAAAATCAA ATTGATATTT AAGCATATTT TACCTAATAC ATTAGGTGCT ATCGTGGTTA	2340
25	CATCAATGTT TACAGTACCT AGTGCTATTT TCTTCGAAGC ATTTTAAAGT TTCATTGGTA	2400
	TAGGTGTACC CGCACCTCAA ACATCGTTAG GGTCATTAGT AAATGATGGG CGCGCAATGT	2460
	TATTAATTTA TCCACATGAA TTATTTATAC CAGCAATGAT TTTAAGTTTA TTAATTCTAT	2520
30	TCTTTTACTT ATTTAGTGAT GGATTACGTG ATGCATTTGA TCCGAAAATG CGTAAATAAA	2580
	AAGGGGGCAT AGCATATGAC TGAAAGAATA TTAGAAGTAA ATGATTTGCA TGTTTCCTTT	2640
	GATATTACAG CAGGGGAAGT GCAGGCAGTG AGAGGCGTAG ATTTTATTT GAACAAAGGG	2700
35	GAAACATTGG CAATTGTTGG TGAATCAGGT TCAGGTAAAT CTGTAACAAC AAAAGCAATT	2760
	ACAAAATTAT TCCAAGGGGA CACAGGAAGA ATTAAAAAGG GAGAAATTTT ATTTTATGGG	2820
40	GAAGTTT TAG CAAAAAACC TGAAAATGAG TTGATTAAAT TACGTGGCAA AGATATTTCA	2880
	ATGATCTTTC AAGATCCAAT GACATCTTTA AACCCAACGA TGCAAATTGG TAAACAAGTC	2940
	ATGGAACCAT TAATTAAGCA CAAAAATTAT AGTAAAGCAC AAGCTAAAAA GCGCGCATTG	3000
45	GAAATACTAA ATCTTG TAGG TTTACCAAAT GCAGAAAAAA GATTTAAAGC ATATCCTCAT	3060
	CAATTTTCAG GTGGACAAAG GCAAAGAATT GTTATTGCAA CCGCATTAGC TTGTGAACCT	3120
	AAAGTGCTCA TTGCTGATGA ACCAACGACT GCATTAGACG TAACGATGCA GGCACAAATT	3180
50	TTAGATTTAA TGAAAGAACT ACAACAAAAA ATCGATACAG CAATTATTTT TATAACGCAT	3240
	GATTTAGGGG TTGTTGCGAA TATTGCTGAT AGAGTGGCAG TTATGTATGG TGGTCAAATG	3300
55	GTTGAAACAG GAGATGTTAA CGAAATATTT TATGATCCAA AGCATCCATA TACATGGGGA	3360

EP 0 786 519 A2

	GGAGCGCCAC CTGATTTATT ACACCCACCT AAAGGTGATG CATTGCGAG ACGTAGCAAT	3480
5	ATGCATTAGA TATTGATTTT AAAGTAGAAC CACCGTGGTT TAAAGTTTCA CCGACACATT	3540
	TTGTGAAATC TTGGTTATTA GACGCACGTG CACCAAAAGT TGAAGTACCC GAGCTGGTAA	3600
	AACAACGTAT GAAACCGATG CCTAATAATT ATGAAAAACC ACTCAAGGTA GAAAGGGTGT	3660
10	CGTTCAATGA AAAATGATGA AGTGCTATTA TCTATTAAAA ATTTAAAGCA ATATTTTAAC	3720
	GCAGGAAAGA AAAACGAAGT GgaGCGATTG AAAATATTTT GTTTGATATA TACAAAGGGG	3780
	AAACATTAGG TTTAGTAGGA GAATCGGGGT GTGGTAAATC TACAAGTGGT AAATCAATTA	3840
15	TTAAACTTAA TGATATTACA AGTGAGAGAA TTTTGTATGA GGGTATTGAT ATACAAAAGA	3900
	TTCGTAAACG TAAAGATTTG CTTAAATTTA ATAAAAAGAT ACAGATGATT TTTCAAGACC	3960
	CATATGCGTC TTTAAATCCT AGGTTAAAAG TAATGGATAT AGTAGCTGAA GGTATTGATA	4020
20	TCCATCATTI AGCAACTGaT AAGCGTGACC GAAAAAACG TGTCTATGaT TTACTTGaAA	4080
	CTGTTGGATT AAGTAAAGAA CATGCCAATC GCTATCCTCA TGAATTTTCA GGTGGaCAAC	4140
25	GCCAACGTAT TGGaATTGCC CGTGcATTAG CCGTTGaACC AGAATTCATT ATCGCGGACG	4200
	AACCAATATC GGCATTGGAT GTTTCAATCC AAGCTCAAGT AGTTAATTTA TTATTAAAAT	4260
	TACAACGTGA AAGAGGGATT ACGTTCCTAT TTATAGCTCA TGATCTATCA ATGGTGAAGT	4320
30	ATATTTTCA GA TCGTATTGCA GTCATGCATT TTGGGAAAAT AGTTGAAATT GGACCGGCAG	4380
	AAGAAATTTA TCAAAATCCA TTACACGATT ATACTAAGTC TTTATTATCA GCCATTCCAC	4440
	AACCTGATCC TGAATCAGAA CGCAGTCGCA AACGATTTAG TTATATTGAT GATGAAGCAA	4500
35	ATAATCATTI AAGACAATTA CATGAAATTA GACCGAATCA CTTTGTCTTT AGTACTGAAG	4560
	AAGAAGCGGC ACAACTACGA GAAAATAAAT TGGTGACACA AAATTAAGGG GAAGGGGGAA	4620
40	ATGCAATGAC GAGAAAATTT AGAACACTTA TTTTAATTTT GATTGCTACA ATTGCATTAA	4680
	GTGGTTGTGC TAATGACGAT GGTATTTATT CAGATAAAGG TCAAGTATTC AGAAAAATTT	4740
	TGTCATCAGA CTTAACATCC CTTGATACAT CATTAAATAAC GGATGAAATA TCTTCTGAAG	4800
45	TGAcTGCgCA AACATTcGAA GGTtTATACA CATTAGGAAA AGGTGACAAA CCGGTGTTAG	4860
	GTGTTGCGAA AGCTTTTCCT GAAAAGAGTA AAGATGGTAA AACTTTAAAG GTTAAATTAA	4920
	GAAGCGATGC TAAATGGAGC AATGGTGACA AAGTGA CTGC ACAAGACTTT GTTTATGCTT	4980
50	GGAGAAAAAC AGTTGACCTT AAAACAGGTT CTGAATTTGC ATACATTATG GGGGACATTA	5040
	AAAATGCGAG TGATATTAGT ACTGGTAAGA AACCTGTAGA GCAATTAGGT ATCAAAGCAT	5100
55	TAAATGATGA AACATTACAA ATTGAATTAG AAAAGCCGGT TCCATATATT AATCAATTAT	5160

ACGGTACGGC AGCTGATAGA GCGGTATACA ATGGTCCaTT TAAAGTTGAT GATTGGAAAC 5280
 AAGAAGATAA AACCTTACTA TCTAAAAATC AGTATTATTG GGATAAAAAG AATGTAAAAT 5340
 TAGATAAAGT GAATTATAAA GTTATTAAAG ACTTACAAGC CGGTGCAATCA TTGTATGATA 5400
 CTGAATCAGT AGATGACGCA TTTATTACTG CAGATCAAGT AAATAAATAT AAAGACAACA 5460
 AAGGATTAAA CTTTGTGTGA ACGACTGGGA CATTTTTTTGT AAAAATGAAT GAAAAACAAT 5520
 ATCCTGATTT TAAAAACAAA AATTTAAGAT TGsTATCGCA CAAGCAATAG ATAAAAAAGG 5580
 ATACGTTGAT TCAGTGAAAA ACAATGGCTC AATTCCTTCC GATACACTAA CAGCCAAAGG 5640
 AATTGCGAAA GCGCCTAATG GCAAAGATTA TGCGAGTACC ATGAATTCGC CTTTAAAATA 5700
 TAATCCTAAA GAAGCAAGAG CACACTGGGA CAAAGCTAAA AAAGAGTTAG GTAAAAATGA 5760
 AGTGACATTT TCAATGAACA CAGAAGATAC ACCAGATGCA AAAATATCTG CTGAATATAT 5820
 CAAATCGCAA GTTGAGAAAA ATTTACCAGG AGTTACTTTG AAAATTAAGC AATTACCGTT 5880
 TAAACAAAGA GTATCACTAG AACTGAGTAA CAATTTTGAA GCATCACTTA GTGGTTGGTC 5940
 TGCAGATTAC CCTGATCCTA TGGCTTATTT AGAAACAATG ACCACAGGTA GCGCACAAAA 6000
 TAATACAGAC TGGGGTAATA AAGAATATGA TCAATTACTT AAAGTAGCAA GAACCAAATT 6060
 GGCACCTCAA CCGAACGAAC GATATGAAAA CTTGAAAAAA GCAGAAGAAA TGTTCTTAGG 6120
 AGATGCACCG GTAGCACCAA TTTATCAAAA AGGTGTtGCA CATTTaACAA aTCCTCAAGT 6180
 AAAAGGATTA ATTtACCATA AATTTGGTCC AAATAACTCA CTTAAACATG TATATATTGA 6240
 TAAATCGATA GATAAAGAAA CAGGTAAGAA GAAAAAATAA TATGCTTTGT AAATTAGGCT 6300
 GGAGACATAT CTCCAGTCTT TTTGTGTTGG ATAAAAaCTT TGGGAATAAA AATTTAAAAT 6360
 AAGTCGTTTT TTAATTACTT GAAATTGATT AAATGCATAA ATAAGTGAAT ATTCTAAAAA 6420
 TAAACTTGTA ATAATTTTTT CTATGAGTAA ACTAAAAAGA AAAAATTAGA TTGAAAGTAG 6480
 GAGGCATATG TATGGGGAAG CTAATTAAAT ATATTTCAAT ACTTCTTATT GTCGTTTTAG 6540
 TGTGAGTGC TTGCGGAAAA AGCAGTAATA AAGATGAAGG AGTAAAAGAT GCTACTAAAA 6600
 CGGAAACCTC AAAACATAAA GGTGGTACCT TAAATGTAGC ATTAACAGCA CCGCCAAGTG 6660
 GTGTTTATTC TTCGTTATTA AATAGTACAC ATGCAGATTC TGTAGTTGAG GGATATTTTA 6720
 ACGAAAGCTT 6730

50 (2) INFORMATION FOR SEQ ID NO: 52:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6482 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double

55

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 52:

5	AATTTTGTGC ATTATTAAAA ACCTCGCTTT TAAAGATTG AAAAGTAAAT GAGTGAAATT	60
	AAAGATTATG CACATTAAAA TCACGCCACA ATTTAATTGT GAAAAATATC ACAAATATAT	120
	TATAACACTA AATTTCCCAA AATTCAAAAG TGTGTTTTAT TGCAGAAAAC TTATAACAYG	180
10	TGCACAAGTT ATAGTGAATT GCAAACGGAT TACTTTAGTC TTTTAAAAAC ATGAAGTATA	240
	ATTTGTATAG CAATAAATAT AAAAATGGGA GGCTATGTTT AATGAGCAAT ATGAATCAAA	300
	CAATTATGGA TGCATTTTCAT TTCAGACATG CACTAAGCA ATTGATCCA CAAAAGAAAG	360
15	TTTCGAAAGA AGATTTTGAA ACAATATTAG AGTCAGGTAG ATTGTCTCCA AGTTCTCTTG	420
	GGTTAGAACC TTGGAAGTTT GTCGTGATTC AAGATCAAGC GTTACGTGAT GAATTAAAAG	480
	CGCACAGTTG GGGCGCAGCA AAACAATTAG ATACAGCGAG CCATTTTGTG CTAATTTTTG	540
20	CGCGTAAAAA TGTAACGTCA AGATCACCGT ATGTACAACA TATGTTAAGA GATATTAAAA	600
	AATATGAGGC ACAAACGATT CCAGCTGTTG AACAAAAATT CGATGCATTC CAAGCAGATT	660
25	TCCATATTTT TGATAATGAT CAAGCCTTGT ATGACTGGTC AAGTAAACAA ACGTATATTG	720
	CATTAGGCAA TATGATGACG ACAGCCGCAT TGTTAGGTAT TGATTCATGT CCGATGGAAG	780
	GTTTTAGTCT GGATACAGTG ACAGACATTT TAGCAAATAA AGGGATCTTA GATACTGAGC	840
30	AATTTGGTTT ATCAGTGATG GTCGCATTTG GCTACAGACA ACAAGAGCCA CCGAAAAATA	900
	AAACACGCCA AGCTTATGAA GATGTTATTG AATGGGTTGG ACCAAAAGAA TAAATAGAAT	960
	ACCGTATGTC TAAATATATA AAATTAATAA GTTAGCAATA AAAAAGCCTG CGATTACATA	1020
35	AATGAATCGC AGGCTTTTGC GTGAAAAAAT TGTATTAATA AAGTATGGAT GATTATTTTT	1080
	CTGGTACAAG GTCAGTATTT GAATGAAGTG TGATGTCAAA CCCTTCTGGT GCCGTAAATG	1140
	TATGTGTTGA GCGTCGGGT TGATAAATAT CAACATGTGT TAATCCATAA CTTTGTGAAT	1200
40	TGTTTTGTCT TGCTTGATTG GATTGCCAAG TATTAGCAGC AATATGATGG TGATAATGAT	1260
	TCGTTGACAT AAATAGCGCA CGTGGAAAAT CAGACACATG TTGGAATCCT AATTGTTCAA	1320
45	TGTAACATTG ATATGCTGCG TCTAAATCAT GTGTTTTTAA ATGTAAGTGT CCAATCATGC	1380
	CTTTTGCTGG CATTCCTTGC CAACCTTCAT CAGTACGATG TGTTAATAAG GTTTGGCTAT	1440
	CAACTTCTAA AGTATCCATT TTAACCTTGC CATTTTGCCA TTCCCATGAA GATGAAGGTC	1500
50	TATCGCGATA GACTTCAATA CCATTACCTT CGGGGTCGTT GAAATATAAA GCTTCACTTA	1560
	CTAAATGATC ACCAGCGCCG ATGCCCATAT TTTTTTGTGC CACGAAATAT AAGAAGTTAG	1620

55

	aAGTCTGACG GcCGTCTTCT AATAAATGTA ACGTTAGAGT ATGGcCACCA GTCCCAACAG	1740
	ATAATACGGT TGTATTATCG TCAGAACTTT TAACGGATAG TCCTAAAATG TTTTGTAAA	1800
5	ATGTTGTCAT TAAGTCTAAG TCTCTTACGT TCAGTACAAT GTTTGTCACT TGTGTTGCTG	1860
	TTTTATCGTG AAATGCCATT ATGCATCGCC TCTTTTTCTA TTTTCTATA AGTTAGTATA	1920
10	AAAAGTATAC CAGAAAAGAA AATGAATTGA TAGCATAAAG TTTGAAATGC AAAATAACTA	1980
	GTCGTTTTGC AATTTTATcAT TGATGCGAAC AAAAAAGCGA TGGTACAGTT GCACCATCGC	2040
	AAAATTTATT TAACCAAGAT ATACATCTTG ATATGAATCT TCTTTTTCTA ACATATGTTT	2100
15	GGCAAATGAA CATGAGGCAA TAATTTTCAA ATTATTTTCT CGAGCGTGTT CAACAACTGc	2160
	TTTAAGTAGT TTTTGGCAA CACCTTGACC ACCAAGTTCA TCAGATACGC CTGTATGATC	2220
	AATGTTAATT TCATTATTAT CCACAAAACG GTATGTGATT TCAGCTAAAG CATTATTTTC	2280
20	ATCATCACCA ATATAGAATT TGTTCTCGCC TTGTTTGATT TCAAGGTTAC TCATACATAT	2340
	CAACTCCTAT CATGATTGAT TATAGTATTT CCCTATTCTA TTTTAACTTA AACGAAGTCA	2400
	AAGGTGCATG ACAGTCATGT GACGACATTG CCACATCTAT GTAGTCGTTT TTATTAAGCA	2460
25	CAGTTTGAAA TGAAGATGAA AACACGTATC TTGACATTAA ATCTATTCAG CTATATAATT	2520
	TATCTCGAAA TCGAAATAAA ATAAAAAGT TGGTGATCAT ATGGATCGAA CGAAACAATC	2580
30	TCTCAATGTT TTTGTGCGAA TGAATAGGGC GTTAGACACA TTAGAGCAAA TTACAAAAGA	2640
	AGACGTAAAG CGATATGGCT TAAATATTAC TGAATTTGCA GTGCTCGAGT TGCTTTATAA	2700
	TAAAGGTCCG CAACCAATTC AACGTATTAG AGACCGCGTA TTAATTGCAA GTAGCAGCAT	2760
35	TTCATATGTT GTAAGTCAAT TAGAGGACAA AGGTTGGATT ACACGTGAAA AGGATAAAGA	2820
	TGATAAACGT GTATATATGG CTTGTTTAAC TGAAAAAGGT CAAAGTCAAA TGGCAGATAT	2880
	TTTCcCTAAG CATGCTGAGA CATTAAACAA AGCGTTTGAT GTGTTAACAA AGGATGAATT	2940
40	AACAATCTTA CAACAAGCGT TTAAGAACT AAGTGACAA TCTACAGAAG TGTAAGGCGT	3000
	GCACTAAAAA TTTACATTAA AGTATCTCGA TTTCGAGATA AATGCACTAA AAATATAAAG	3060
	AGGGTATATA AAATGATAAA TAATCATGAA TTACTAGGTA TTCACCATGT TACTGCAATG	3120
45	ACAGATGATG CAGAACGTAA TTATAAATTT TTTACAGAAG TACTAGGCAT GCGTTTAGTT	3180
	AAAAAGACAG TCAATCAAGA TGATATTTAT ACGTATCATA CTTTTTTTGC AGATGATGTA	3240
50	GGTTCGGCAG GTACAGACAT GACGTTCTTT GATTTTCCAA ATATTACAAA AGGGCAGGCA	3300
	GGAACAAATT CCATTACAAG ACCGTCTTTT AGAGTGCCTA ACGATGACGC ATTAACATAT	3360
	TATGAACAGC GCTTTGATGA GTTTGGTGTT AAACACGAAG GTATTCAAGA ATTATTTGGT	3420
55		

EP 0 786 519 A2

TTAAATGAAG GGGTAGCACC TGGTGTACCT TGAAGAATG GACCGGTTCC AGTAGATAAA 3540
 GCGATTTATG GATTAGGCCC CATTGAAATT AAAGTAAGTT ATTTTGACGA CTTTAAAAAT 3600
 5 ATTTTAGAGA CTGTTTACGG TATGACAACT ATTGCGCATG AAGATAATGT CGCATTACTT 3660
 GAAGTTGGCG AAGGAGGCAA TGGTGGCCAG GTAATCTTAA TAAAAGATGA TAAAGGGCCa 3720
 10 GCaGCACGTC AAGGTTATGG tGAGGTACAT CATGTGTCAT TTCGTGTGAA AGATCATGAT 3780
 GCAATAGAAG CGTGGGCAAC GAAATATAAA GAGGTAGGTA TTAATAACTC AGGCATCGTT 3840
 AATCGTTTCT ATTTTGAAGC ATTATATGCA CGTGTGGGGC ATATTTTAAT AGAAATTTCA 3900
 15 ACAGATGGAC CAGGATTTAT GGAAGATGAA CCTTATGAAA CATTAGGCGA AGGGTTATCC 3960
 TTACCACCAT TTTTAGAAAA TAAAAGAGAA TATATTGAAT CGGAAGTTAG ACCTTTTAAT 4020
 ACGAAGCGTC AACATGGTTA ATTGGAATGA GGAGGATTTG TGATGGAACA TATTTTLAGA 4080
 20 GAAGGACAAA ATGGTGCGCC AACACTAATA TTATTGCATG GTACAGGTGG TGATGAGTTC 4140
 GATTTATTAC CGTTAGGCGA AgcATTGAAT GAAAATTATC ACTTGTTAAG TATTAGAGGA 4200
 CAAGTTTCAG AAAATGGGAT GAACCGTTAT TTCAAACGTC TTGGTGAAGG TGTTTATGAT 4260
 25 GAAGAAGATT TGGCATTTCG TGGACAAGAA TTGTTGACGT TCATTAAAGA AGCTGCTGaa 4320
 CGTTATGATT TTGaTATTGA AAAAGCAGTA CTTGTTGGAT TTTCAAATGG ATCAAATATA 4380
 GCGATTAAC TAAATGTTGCG TTCAGAAGCA CCATTTAAAA AAGCATTGTT ATATGCACCG 4440
 30 TTATACCCAG TTGAAGTAAC GTCAACAAAG GATTTATCAG ATGTCAGTGT GTTGCTTTCT 4500
 ATGGGGAAAC ATGATCCAAT TGTGCCATTA GCTGCAAGTG AACAAGTCAT TAACTTGTIT 4560
 AATACACGTG GGGCACAAAGT CGAAGAAGTT TGGGTGAAGG GCCATGAAAT TACAGAACT 4620
 35 GGATTAACGG CTGGTCAACA AATACTTGGG AAATAACAGT TCTATTAAGA AGCGGACAGA 4680
 TGGA[~]AAAGAT TTTTACTTTT CATCTGCCCG CTTTTTTGAT TTTGAAGTGC TGTACTAAAT 4740
 40 TTTA[~]CAATAG TATAGATATT TTAATCGATA TGAGATTTGC CGGTAATACG CTTAATTAAA 4800
 CCTTTATAGA GTACAGGTAT GAGTAAGATG AAACCGAACA ATCCATAAT AGGGAATACT 4860
 TTTCCAATTA ATGAAATGaa ACCGATAAAT GTACTAATAT AAGTGATGAC AGCCATTGTA 4920
 45 ATAATAATGA TGAAGTAACG TCTGCTGAAT GGAACGCTGA AACGTGACGC AAATGCATAC 4980
 ATTAATCCAA CAACAGTATT GTAGATGACA AGTATCATAA TGACAGACAT AATAATACCA 5040
 ATTGACGGAG ACATTTGTGT CGCTAATTTT AATGTAGGTA GATCTACGTG TTTAATTTTA 5100
 50 TCGAATTGAG AAATTAAACC TAGATTAATC ATCATGAGTA AAAATGTAAT GATTAAACCG 5160
 CCAATCAAGC CCCCCTATAA CGTTGAGTCA CGATATTTAA CTTTACTACC CATCACTGAT 5220

55

5 340
 5400
 5460
 5520
 10 5580
 5640
 5700
 15 5760
 5820
 5880
 20 5940
 6000
 6060
 25 6120
 6180
 6240
 30 6300
 6360
 35 6420
 6480
 AT - 6482

40 (2) INFORMATION FOR SEQ ID NO: 53:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 16592 base pairs
 (B) TYPE: nucleic acid
 45 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

50 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 53:

60
 120

55

	AATTTTTCTA ACTTTAACGT AGACATAACT ATATAAATTT TGATAATTAC GTTATACTTA	240
	TCATTAATAA GTATCACATT AAACATGATA CATGAATCGA TATTCATTT AAGACACTGC	300
5	ATACAGTCGA GCATATTGTA TGACCTACTG AATGGATTAT CTTATAATAA TAAATCATAT	360
	ATCTAATTAA GAATTGAGGT TTTAATCTTG AGTACTAAAA ACAAACACAT CCCATGTTTA	420
10	ATCACAATCT TTGGTGCACT GCGTGACTTA AGCCATCGTA AGTnGTTTCC ATCAATATTC	480
	CATCTCTACC AACAAGACAA TTTAGATGAA CATATTGCCA TcATCgGTAT TGGACGTCGT	540
	GACATkwnTA ATGATGATTT CCGTAATCAA GTAAATCAT CAATTCAAAA GCACGTAAAA	600
15	GATACAAACA AAATTGACGC GTTTATGGAA CATGTCTTCT ATCATAGACA TGATGTTAGT	660
	AATGAAGAAA GCTATCAAGA ATTACTAGAT TTTAGTAATG AATTAGATAG CCAATTTGAA	720
	TTAAAAGGTA ATCGACTATT CTATTTAGCA ATGGCACCAC AATTCTTTGG CGTTATTTCT	780
20	GATTATCTAA AATCTTCTGG TCTTACTGAT ACAAAGGAT TTAAACGCCT TGTATCGAA	840
	AAACCATTCTG GTAGTGATTT AAAATCAGCC GAAGCATTA ACAATCAAAT TCGTAAATCA	900
	TTTAAAGAAG AAGAAATTTA TCGTATTGAC CACTATTTAG GAAAAGACAT GGTTCAAAAT	960
25	ATCGAGGTAT TACGTTTTGC GAATGCGATG TTTGAACCAT TATGGAATAA CAAATATATT	1020
	TCAAACATCC AAGTTACATC TTCTGAAATA CTAGTGTTG AAGATCGTGG TGGTTATTAT	1080
30	GAATCAAGTG GCGCGCTAAA AGATATGGTG CAAAACCACA TGTTACAAAT GGTTCaATTA	1140
	TTAGCTATGG AAGCACCTAT TAGTTTAAAT AGTGAAGATA TCCGTGCTGA GAAAGTAAAA	1200
	GTACTTAAAT CACTGCGTCA TTTCCAATCT GAAGATGTTA AAAAGAACTT TGTTCTGGGT	1260
35	CAATATGGCG AAGGCTATAT CGATGGTAAA CAAGTTAAAG CATACCGTGA TGAAGATCGC	1320
	GTTGCAGATG ACTCTAACAC ACCTACCTTT GTTTCAGGTA AATTAACAAT TGATAACTTT	1380
	AGATGGGCTG GTGTACCATT CTATATTCGT ACTGGTAAAC GTATGAAATC TAAAACAATT	1440
40	CAAGTTGTCG TTGAATTTAA AGAAGTACCA ATGAACCTAT ACTATGgAAA CTGaTAACT	1500
	GTTAGATTCA AACCTATTAG TAATCAATAT CCAACCTAAT GAAGGTGgTA TCTTTtACAT	1560
	CtAAATGcTA AGaAAAATAC ACAAGGTATC gAAACAGrAC CTGtCCmATT GtCTTACTCm	1620
45	ATGaGCGcTC aAGaTAAAT GaATACTGTA GATGCATATG AAAATCTATT ATTTGATTGT	1680
	CTTAAAGGTG ATGCCACTAA CTTACGCGAC TGGGAAGAAT TAAaATCAAC ATGGAAATTT	1740
50	GTTGATGCAA TTCAAGATGA ATGGAATATG GTTGaTCCAG AATTCCTAA CTATGAATCA	1800
	GGTACTAATG GTCCATTAGA AAGTGATTTA CTACTTGCTC GTGATGGTAA CCATTGGTGG	1860
	GGACGATATT CAATAATTGA ATTAAAACGC ACATGTTAAA CAAAAATAAA TGAGCGAATG	1920

55

	TATATTATGA AATTATATTT TACAATGCCC AAAACTATTT TAATAATCAT TGAACAAATG	2040
	GGTGTATAAT TTATAGAAAT AATGTAGAAT AAAAATAAAT GATTGAATTA ATTGGAGTGA	2100
5	AAGTTTTGGA CGTTATCAAG CAAATACAAC AGGCAATTGT TTATATTGAA GATCGTTTAT	2160
	TAGAGCCTTT CAATTTGCAA GAATTAAGTG ATTACGTTGG TCTTTCGCCA TACCATCTTG	2220
10	ATCAATCATT TAAAATGATT GTCGGCTTAT CTCCAGAAGC TTATGCACGC GCGCGTAAAA	2280
	TGACACTCGC TGCAAATGAT GTGATTAATG GTGCTACACG ACTTGTAAGT ATCGCTAAAA	2340
	AATATCACTA TGCAAATTC AATGATTTTG CAAATGATTT TAGTGATTTT CACGGCGTAT	2400
15	CACCTATTCA AGCCTCTACT AAAAAAGATG AATTACAAAT TCAAGAGCGA TTATATATCA	2460
	AATTATCAAC TACTGAGAGA GCACCTTATC CATACAGATT AGAAGAGACA GATGATATTT	2520
	CATTGGTTGG ATATGCACGA TTTATAGACA CTAAGTATTT GTCACATCCT TTTAATGTTT	2580
20	CGGATTTTTT AGAAGACTTG CTCATTGATG GTAAAATTAA AGAGTTACGA CGATATAATG	2640
	ACGTTAGTCC ATTTGAACTA TTTGTTATTA GTTGTCTCT TGAAAATGGT TTAGAAATAT	2700
	TTGTAGGTGT ACCAAGTGAA CGTTATCCTG CACACTTAGA AAGTCGATTT TTACCTGGCA	2760
25	AACATTGTGC GAAATTCAAT TTACAAGGTG AAATTGATTA TGCAACTAAT GAAGCTTGGT	2820
	ACTATATTGA ATCAAGTTTG CAGTTAACAT TGCCATATGA ACGAAATGAT TTATATGTTG	2880
	AAGTGTAACC TCTCGATATT TCATTTAATG ACCCATTAC TAAAATTCAG CTTTGGATTC	2940
30	CTGTAAACA GAGTCCTTAT GACGAAGATT AAATAATAAA AAACAAAGAA GCCCCCTAAT	3000
	ATATCTATAG GTCTACAAAT GGCCTTAGAT TCTATTAGG GGCATATTAA TATGTTAATT	3060
35	TAGTTCGATA ACACATGCTT CATATGGACG TAACTGTTTT AAATTAACCT TGGCATCATA	3120
	ATTAAATAGC TTTACTTCTC CATGGCTTAA ATCAAATGGT ACAGTTAATT CTGCTTCGTG	3180
	GTTAGTAAGA TTACCTACAA TAAGAACTTG CTTTTCATTT AATGTTCTCG TGTACGCAA	3240
40	AACTTGTGAA TTTTCAGCAT CTACTAAATC AAATTGACCA TATACGTATA CATCATTAGA	3300
	CTTTCTTAAT TGAATTAAAT CTTTATAAAA TTGTAATACT GAATGCTCAT CTTCTAATTG	3360
	TTGTGCAACA TTGATAGTTT TATAATTCCG ATTCACTGGG AACCACGGTT CACCATTTGT	3420
45	AAATCCTCCA TTTAACGTAT CATCCCATTG CATTGGTGTG CGAGAATTAT CTCGGTTCTC	3480
	ATCTTTATAT TTCGCAAGTA AAGCGTCTAC ATCTCCACCT TGAGCTTTCA CTATTTGATA	3540
	GTCATTTTTA ACAGCAACAT CGTTAAACGT TTCAATACTT TCAAATGGAT AATTCGTCAT	3600
50	ACCAATTTCT TGACCTTGAT AAATGAATGG CGTACCTTGT TGCAAGAAAT AAACAGCTGC	3660
	ATGACTTGTT GCTGATTCAT ACCAATACTT GTCATCGTCA CCCCACGTCG ATACACGTCG	3720

55

EP 0 786 519 A2

	CCATCTATTT AATACAGATT TATACGAATT TACATCAAAG TGAGAATCAC CACTATTCCA	3840
	CAGTCCCAAA TGTTCAAATT GGAATATCAT ATTAAATTTA CCATTTTCTT CCCCAGCCCA	3900
5	GTCATCAGCA TCATCAGGGC TTACACCATT CGCTTCACCA ACAGTCATAA TGTCATACTT	3960
	ACTTAATGAG CGATCTTTCA TCTCTTGTA CCAAGTTTGT ATACCTGGCT GATTTCATATC	4020
	TACATCAAAT GCTGGGGCAT ATGTTTTACC CTCAGGTACA GGTAAGTCAC CCGCTTCAAA	4080
10	CGTCTTCTTA ATATGCGTAA TTGCATCTAC TCTAAATCCA TCAATGCCTT TATCAAACCA	4140
	CCAGTTCATC ATTTCAAATA CAGCATCTCT AACTTCCGGA TTACCCCAAT TCAAATCAGG	4200
15	TTGTTTTTTA CTGAATAAAT GGAAATAATA TTGCTCAGTA TTAGCATCAT ATTCCCATGT	4260
	AGATCCATTA AATATACTTT CCCAGTTGTT AGGTTTCAGAG CCATCTGGCT TTGGATCTTG	4320
	CCAAATGTAC CAATCACGTT TGGGATTGTC TTTACTAGAT TTGGATTCTA TAAACCAAGG	4380
20	ATGTTTCATCA GATGTATGAT TTACAACTAA ATCTAAAATA AGCTTCATGC CTCTATCATG	4440
	AACACCTTTT AATAAACGAT CAAAGTCTTC CATCGTTCCA AATTCATCCA TAATCTCTTG	4500
	GTAGTCACTA ATATCATAAC CATTGTCATC ATTAGGTGAT TTAAACATTG GACTGAGCCA	4560
25	AATGACATCG ATACCGAAAT CTTTTAAGTA GTCCAATTTA TCAATCATT CAGGTAAATC	4620
	CCCAATACCA TCGTGATTAC TATCATTAAA ACTTCTTGGA TATACTTGAT ATGCTACTGC	4680
	TTCTTTCCAC CATTGCTTAT TCATTTTAAA ACTCCTTTGC TATCGCTGTG TTGATTTTCT	4740
30	TATTTTTAAT TCTGTATCTA TAATGACGAG TTCAATAACA TCCTGTGCTT TGTTTTTCAA	4800
	TATATTTAAA ATTGCTGCAC CAGCCTGTTG ACCTAACATT CGAGGCTTGA TGTCAATACA	4860
	GGTTTGTGGT GGTGACGCAA TTTCGGTTAA ATAAGAATCA TTGAACGTTG CTGTCATTAC	4920
35	ATCTTTCGGA ATTTCAATAT TAAGTTCATA TAGGACACTT AAAATCGCTA AATGTAACAT	4980
	AGCATCTAAC GAAATGATTG CCTGTTTAAT ATTTGGGTCC TTCAAACGCG TATGTAGATT	5040
40	TTGCATGTAA TTAAAAATAA CTTCTCTTTC ATTACTAGTC TCAATAATTT GATAATTAAT	5100
	TTTATTTTGA GAAGCTATCG TTTCAAATCC TTGAATTCTA TCTTTTGAAA CTTCAAATTT	5160
	TCCTTTTTCT GTAATAAATA TTAATTCATC TACACCTTGT TCAATAACAT GTCGTGTCAA	5220
45	ATTTTCAGAA GCTAATATAT TATCATTATC TATATGTGTA AATTGATGAT CTATATCCGA	5280
	TGTAGGCTTA CCAATCACAA TAAATGGCAT GCTTTCATCA ATTAACATTT GTTTAATCGG	5340
	ATCATTTTCT TTTGAATAGA GCAGTATAAA CGCATCAACC ATTCGTTGTT TAATCATTTT	5400
50	ATAAACTTCA TCCATTAAAT CATTTCATAT ATTTGAGACT GTCGTTTGTG TACCATAGCC	5460
	ATGCTGGTTA CACGTTTCAG AAATTCCTAG CAATACATTG ATGTAGAATG GATTCAGTCG	5520
55		

EP 0 786 519 A2

	AGTTCTAGCA GCGGTATTAG GAAAATAATT CAATTCTTCC ATAACCTTCT TCACTTTTGA	5640
	AATTGTCGCT TCGCTAATAC GTTGATTTCC TTTTATAACT CTTGAAACTG TCGAAGGAGA	5700
5	AACACCGGCT TTTAGTGCAA CATCTTTAAT CGTAACCATT TAATCACCTC CTGTTAATTT	5760
	CTGCATCGGA AAACGCTTCC AACCACTGTA TAATACCACT TTAGTCACAC TTTCTAAAAA	5820
10	AGTCAAAAGA TTTGTGCAAA CGATTGCATA AAACGATAAA AATAAAACCT TCATACTGAA	5880
	ATTCAATCCG AAAATCAATA TAAAGGTTTG TATAAATATT AAAATCGATT GTTTAGTCAC	5940
	TAAC TGCAAA ATAGTTACCT TGGCCATCTT GAAAATTAAA TACACGTTGA CCATTCATTT	6000
15	CTACTATATC ATGCCCAGTT AAACCTAAAT CATTTAATTT TGAGTATAAT GCATCAAAGT	6060
	TTTTCTCTTT AAACATTAAA GATGGTGTTC CTAGGTTTAC TTCCGGGCTA TGCTTTTCAA	6120
	TAAATCTTT TGCCATAATC GTCAATGACG TTTCAGCATC TTTGGTAGGT GATACTTCAA	6180
20	CTGCAACATA GTCCTCAGCT AACGGTGTTC CACTTACAAC AACAAATTCT AAAGTTTCTG	6240
	TCCAAAATGC TTTCGCTTTT TCGACATCAT CAACATATAA CATAACTTGA TTTAACTTTT	6300
	CCATAAAATA GTACCTCTAT TTCTCTATAG TACATGCTAT CATAACACAG TAAATATTTT	6360
25	ATTACTTCAC AAAATGCTTA AAAATATGGC GGGATGCTTT TAAGGTCAAG GATAATACTT	6420
	GTGTAATTTT TTATAGGTTG TAGCTACTCT ATCACACTCT CTTTTATATT TATCAAAAGA	6480
	TATAAAAAAG GATAGTATCT TTCAACTATC CTTTAATCAA TATTATTCTT CAATCCATTG	6540
30	TGTATGGAAT ACGCCTCTT TATCTTTTCT TTCGTACGTA TGAGCACCGA AGTAGTCACG	6600
	TTGTGCTTGA ATTAAGTTTG CAGGTAAATC AGCAGCACGG TAACTATCAT AGTAATTAAT	6660
35	ACTTGATGAG AAACCAGGTG TTGGTACACC ATTTTGAACA CCAGTTGCGA CAACATCACG	6720
	TAACGCATCT TGATATTGAG TAACGATGTT TTTAAAGTAA GGATCTAGCA ATAAGTTTGT	6780
	TAATCCTGGA TTATTATCGT AAGCATCTTT GATCTTTTGT AAGAATTGTG CACGGATAAT	6840
40	GCAACCTTCT CTCCAAATCA TAGCTAAATC ACCAAGTTTT AAATTCATT CATTATCTTC	6900
	ACTTGCTTTA CGCATTTGcG CGAAACCTTG TGCATAAGAA CAAATTTTAC TCATATATAA	6960
	TGCTTTACGA ATTTTTTCTA AAAAGTCTTT CTTGTACCA TCAAATGATG CTTTGGACC	7020
45	ATTTAATTCT TTAGAAGCAT TTACGCGCTC TTCTTTGaTT GAAGAGATAA AACGTGCAAA	7080
	TACAGATTCA GTAATGATTG TTAATGGAAT ACCTAATTCT AATGCGTTAA TTGAAGTCCA	7140
50	TTTCCTGTA CCTTTTGTaC CTGCAGTATC AAGAATTTTT TCAACTAATG CTTCTTTATT	7200
	TTTATCTAAT TTCATGAAAA TATCACCAGT GATTTCAATT AAATAACTTT CTAATTCACC	7260
55	AGCATTCCAG TCTTTGAACG TTTGAGCAAT GTCTTCATGA GACATGCCTA ATAATTCTTT	7320

EP 0 786 519 A2

	CATTTTCACA TAGTGTCCAG CACCATTAGG TCCAATATAA GTAACACATG AAGCACCGTC	7440
	TTTTGCCTTT GCAGCAATTG CATCAAGAAT ATCTGCAACT TTGTTATAAG CTTCCTCTTG	7500
5	TCCACCCGGC ATTAATGACG GACCAGTTAA CGCTCCAATT TCACCACCAG AAACGCCCCAT	7560
	ACCAATAAAG TTGATTGCAC TTTGTGyWAA TGCTTTATTA CGTCTGATAG TATCTTGATA	7620
	GTTTGTATTA CCACCATCAA TTAAAATATC TCCATCATCT AATAAAGGTA ACAAACATATC	7680
10	AATCGTTGCG TCCGTAGCTT TACCTGCTTG AACCATTAAT AAAATTTTAC GTGGTTTTTC	7740
	TAAAGAATTA ACAAATCTT CCAATGAATA CGTTGGATGA ATATTTTTCC CTTTTGATTC	7800
15	TTCAACCATT AAATCAGTTT TTCACTTGA GCGGTTAAAT ACAGATACAC TATATCCGCG	7860
	TGATTCAATA TTCCAAGCTA GGTTTTTACC CATAACGGCT AAACCAATAA CTCCAATTTG	7920
	TTGTGTCATA TTACTTACCT CACTTGTGTA TTTTTCATTA GTATTGTATC ACAAATAGA	7980
20	CATACACTAC ACTAAATCAT TTCGAATGTC GCGCAACTAT TTTGATTATT TCTAACACTT	8040
	GACTTGCAAG CAAGTTCAAT GATTTAATCG GCATTCTCTC ATTTGTTGTA TGGATTTTTT	8100
	CATAACCCAC TCCTAAAATG ACTGAAGGAA TACCAAATGT ATTAATAATA CTGCCGCTCG	8160
25	AACCGCCACC AGAAATAATT GTATTGTCAG ATAATCCTAA ATTACGAGCA CTTTCTTGTC	8220
	CAATTTTAAC AACCGCTTCA TTATCATTAA TTTTAAATCC TGGATAACTT TGCTCCACTG	8280
	TAACTACTGC TTTCCACCT AATTCTGATG CAGTAGTTTC AAACACATCA GTCATATGTT	8340
30	TGACTTGTGT TTTTATTCTT TCTGGATCGT GAGAACGTGC CTCTGCTTCT AAAATGACTT	8400
	CATCTGCAAC AATATTCGTA GCTGAACCGC CATGAAACTT ACCAATATTG GCAGTAGTTA	8460
35	TTTCATCAAC TTGTCCTAAT TTCATTGAC TAATTGcTTT CGCCGCAATA TTAATAGCAC	8520
	TAACACCCTC TTTTGGCGTA CTTGCATGAG CCGTTTTGCC AAAAATTTTA GCTGAAATTA	8580
	ACATTTGCGT CGGTGCACCT ACAACCGTAG TACCGACATC AGCACTTGCA TCAATAGCAT	8640
40	AACCAAAGTC CGCGTCCAAC AACTCTGAAT TTAATTCTTT AGCACCAATT AAACCTGATT	8700
	CTTCTCCAAC AGTAATCACA AATTGAATTT GTCCATGTGG GATTTGTTGT TCCTTTATCA	8760
	CTTGCAAAAC TTCAAGCATC GCTGATAATC CTGCTTTATC ATCTGCACCT AGAATAGTCG	8820
45	TACCATCAGA GTATATGTAG CCGTCATCTT TTACAATTGG CTTTACATTA ATTGCGGGTA	8880
	CAACAGTATC CATATGGCTC GTCAAATATA ATTTAGGTAC TTCGCCTTCT TCGATAGTAC	8940
	TATTCAATTGT ACACACTAGA TTATTGGCAC CTAATTTAGG ATGTTTAGCC GCTTCATCTT	9000
50	CTTTAACATC TAACCCTAAT GCTATGAATT TTTCTTTTAA AATAGGTTGG ATTGTTGATT	9060
	CATTCCCTGT CTCAGAATCG ATTTGTACAA GTTCAAAAAA CGTATTAAGT AATCTTTGCT	9120

55

EP 0 786 519 A2

	GATGAAATAA AATGTTACAG TAATTGACGT TACACAGATT TATCAGGTTT GTAAATTGTG	9240
	TCATATTATT TTCAATTTAT TATATATAAT TATTGTAAGT CAAACTAAGC TTTGTCAAAA	9300
5	ATATATTGAT TGATTTTTCA AAGATATCGT ATAATGAGGA AAATGACATA AGCAAACCTA	9360
	CTCATGTTTT TTATTATATT CCTTTATGAT GATTGCTAGT TATATCGTCT CAAGTTAAAA	9420
	GTTTTATATC TTATGTCGTA ATTATTAATA CAAAGGTTAT TCATTTGGAG GCACACAAAA	9480
10	TGCAAAATAA AGTTTTAAGA ATTATCATT TCGTTATGCT TGTATCAGTT GTATTAGCAT	9540
	TGTTATTAAC GAGTATCATT CCAATTTTAT AAATATATC TCAACTACCT ATACAAAATC	9600
15	ATACAATTAA AAATCCATCC ATTATAAAGC CATGTATTAA TAAGTTATCG TATTGCAACG	9660
	ATTACTTTCA AACATGGGTC ATACGGATGG ATTATTTTTT AAGCTACTTC ACTATGCATT	9720
	TTCAATGAAC CAAATGCGA TTTGATTTGT AAATATTCTT CTAATTCATT TAATATTTGA	9780
20	ATAATACTTG CTCTCGAGTT AAGCGCTTTG TGTGTTGTTG GCAATGGCAG TTCATCCAAT	9840
	TTCAACGCG TCTCATACAA ATTGTGTAA CGCATTGCTG TATAGTCATT ACTATTCACA	9900
	TTTAGACCAA TTTCTTTTCA CAGTGACGCA ACATCATTTA AAAGCGGATC TTTATGACAG	9960
25	ATACTTTTCA TGAGCGGTTT CATTCTCATT AACAATTCCA CTTGCTCTTC TCGCATATCA	10020
	AAATAATGAT AGTATGAATT TTCGTTTCTA ACAAATGAT TTTTAACATC TCGGAACGCG	10080
	ATAGACTTCG CCTTTTTAAT ATTTAAAAGT AACACTTCAA ATTCAATCGC AATGGTATCT	10140
30	TCATATTTTT CACAAATATA ACTATATTTA CTAATAATAT CAGCAATTTG TTGCTCAATT	10200
	TTACATTGT ATTCTCTAG TTGTTTGTCT AAACCTGGCA TCATTAAATT CATGTAAAT	10260
	GCAATGCTTA GTCCAATTAA CAGTAATAAT GTTTCATTAA CAATTAAATG TGCATCAATT	10320
35	GATTTTGCAT TAAAAACATG AAGTAATATA ACGCAACTCG TAATGACACC TTCTTGACT	10380
	TTTAATACGA CAGTTAATGG TATAAATAAC AATACGATAA TACCGAGTAC AATTGGACTC	10440
40	TGACCTAATA AACTAAATAT TGCTGAACCT AAAACAATA CTAAAAACA TGATACTAAT	10500
	CTTGAAATAA TCGCTGTAG CGAATGTACT TTTGTATGTT TAATACATAA TACGACTAAT	10560
	ATGGCGCTTG AAGCATAATT ATCTAAACCT AACAGCTTAC TAATAATTAC ACCTAAAGTC	10620
45	ATACCCACTG CTGTTTTTAT TGTTCTAAAT CCAATCTTGT AAGGATTTAA CTTTAACATG	10680
	GGTTAGCGCC TCTTATCTTT CTTACAATA TTTATTGAAT AATGTTTGTA ATTGATTAAT	10740
	TACGTTATC ACATCATGAC CTTGATTTG ATGTCTTTCA ATCATTTCTG TAATCTTTCC	10800
50	ATCTTTTACT AATGCAAATG ACGGACTTGA AGGCGCATAA CCTTCGAAGT ATTCACGCGC	10860
	TCTTTGTGTC GCTTCTTTAT CTTGTCCAGC AAATACTGTC ACTAGACGAT CAGGTAATAC	10920
55		

	AGAATTGATC ATAAC TAGTG TTGTACCATC TTGTTTAAGA ACTTTGTCAA CATCTTCTGC	11040
	AGTAGTTAAT TGCTCATATC CCGCAGATT C AATTTCAATC CTTGCTTGTT CTACAACACC	11100
5	GTTTCATGTAT AAATCGAAAT TCATGnCCAT AAGTTCAATC ACCTATCCCT TTATATTTAA	11160
	ACTAtCCTCA TTCTACTAAT TAATAACATA TTGTTCAATA AACTAATCTG AATCACACCT	11220
10	ATATTTAGAC ACAATTTTAA CAATATACCA AACATTATTG TGCTTAAAT CATGGTAACT	11280
	AATTTGTTCA CATGTTTTCA TTAATATGTT TCAAGTATGA TGTCTTATTT TGACTTTACT	11340
	GCAAAAATGC ATTCAACCAT GTTGATTATT GTTCTTTATC TTTTTTGAAT ATATTGCACA	11400
15	TATTTTAGTG CCAAAAAATA ATACATCCAT CGACAAGAAC AAGATAAAAC AAGTTGTCGA	11460
	TAGATGCATC TATGTTATCA CTAATATATA TTTGTATTTT CTAAAGTATA CTGTTGATA	11520
	CGCTGTTTAA TATGATTCAT AATTTTACCT GTTTGTAAAC CATCTAAAT ACGATGATCA	11580
20	ATTGAAATAC ATAAATTAAC CATGTTACGA ATTGCAATCA TATCATTAA TACTACTGGC	11640
	TTTTTAACGA TTGATTCTAC TTGTAAATC GCTGCTTG TGATGATTTAT AATACCCATT	11700
	GATGATACTG AACCAAATGT ACCAGTATTA TTTACCGTAA ATGTACCGCC CTGCATATCT	11760
25	TCAGCTGTCA ATTGCTTATT ACGCGCTTTC GTTGCTAAAG TATTAATTTT TCTAGCTATA	11820
	CCTTTGATTG ACTTTTCGTC TGCATGCTTA ATCACAGGTA CGTATAAATTT ATTTTCATCA	11880
30	GCAACAGCAA TTGAAATATT AATGTCTTTA TGTAAGACAA TTTCAATTTCC TGCCAGCTA	11940
	CTATTTAATA AAGGATATGC TTTTAAAGCA TCTGCTACAG CTTTACAAA GAAAGCAAAG	12000
	AACGTTAGAT TATATCCTTC TTTATTTTTA AAGCTGTTTT TATAATGATT TCTCGTATTC	12060
35	ACAAGATTG TAGCATCTAC TTCAATCATC ATCCATGCAT GTGGAATCTC TGTTACACTA	12120
	TTAACCATAT TTTGCGCAAT TGCTTTACGC ACACCATTTA CTGGTATTGT GCTGTTTTCA	12180
	CTATTTGCTT CAGATGATTG GTTACTTGAT GTATCTACTG ATGTTGATTT TGTTTGAAC	12240
40	TGTTTGTCAG ATTGAGCTGT GGTACCACCA TTTTCAATAA CTGACATTAT ATCCTTCTTA	12300
	GTTACACGAC CTTCAAATCC ACTACCTACA ACTTG TGATA AATCAATGTC ATGCTCTGAA	12360
	GCGAGTTTAA ATACAACAGG TGAAAAGCGA CCATTATTAC GTGGTTGATT TTGTTTAGCA	12420
45	GTAGATGTCT GTTCCACTGT TGCACTAGCT TTTT TAGTAG ATTTCTGAGT ATGCTCATCC	12480
	ACTTTTGCTT GTATCTCTTC AGTTGTTTCA TTTGTCTTTT CATCAGCAGT TTCAATTTTA	12540
	CAGATAATTG TATCAATAGC TACTGTCTGC CCCGCTCAA CTAAAATTTT TGTAATTGTT	12600
50	CCTGATATCG TGGAAGGGAC TTCAGCTGTC ACTTTATCTG TAATAACTTC ACATAATGGT	12660
	TCATATTCAT CAATATGATC ACCAACAGAA ACTAACCATT GTTCAATGGT GCCTTCATGA	12720
55		

EP 0 786 519 A2

AATTCACGCA TTTTATTTAA GATTTTTTCT GGATTCATCA TAATTCATT TTCTAATACA 12840
 GGAGAAAATG GCATAGATGG TACatCTGGA GCAGCTAAAC GCATGATTGG TGCATCTAAA 12900
 5 TCGAACAAAGC AATGCTCTGC AATAATCGCT GACACTTCTG ACATAATACT ACCTTCTAAA 12960
 TTATCTTCAG TTACAAGTAA AACTTTACCT GTATGTTTAG CACGATCAAT AATTGTTTCT 13020
 10 TTATCTAATG GATAAACAGT TCGTAAATCA ACGACTTCAA CATTGATACC GTCTGCAGCT 13080
 AAAATATCCG CTGCTTGTA ACAATAATTG ACCATTAATC CATAACAAAA TACTGTTAAA 13140
 TCTTCACCTT CACGTTTCAC ATCTGCTTTT CCTAAAGGTA CAGTGTAATA TTCTTCTGGC 13200
 15 ACTTCTTCCT TTAAGAAACG ATAAGCTTTT TTATGCTCAA AGTACAATAC TGGATCATT 13260
 GATTCGATAG ATGATAATAA AAGCCCTTTA GCATCATACG GTGTGGAAGG AATAACAATT 13320
 GTTAAACCTG GCGATGAAGC AAATATACTT TCAATACTTT GTGAATGATA TAGTCCTCCG 13380
 20 TGAACACCGc CACCAAATGG TGCACGAATC GTTAATGGGC ATTGCCAATC ATTATTTGAA 13440
 CGATAACGCA TTTTCGCAGC TTCACTAATA ATTTGATTTG TCGCAGGTAA AATAAAATCT 13500
 GCAAATTGAA TTTCTGCAAT TGGTCTTTTA CCTACCATAG CTGCACCAAT GGCAGTTCCA 13560
 25 ACAATATTTG ACTCAGCTAA TGGCGTATCG ATAACCTCTGT CTTCAACATA TTTTGTGTC 13620
 AGTCCTTGAG TAGTACCAA TACGCCACCT TTTCTACCAA CATCTTCACC AAGAATAAAC 13680
 ACATCTTTAT TTTGTTGTAA TGCTAAGTCT TGTGCCTGcG TATCGCCTCT AAATAAGATA 13740
 30 ATTTAGCCAT TAGTTAAGAC TCCCTTCTTC GTACACAAAT GCATAGGCTT CTTGACACT 13800
 TGGATATGGC GCGTCTTCAG CAGCCTTTGT CGCTTTATTG ATGATGTCTT TnATgTCCGC 13860
 TTCTATTTCT GCCAACCAAG CATCATCGAT AATGCCAGCT GAAAGCAACT CTTTTTTGAA 13920
 CTTTTCATTG CAGTCTGCTT TTTTAAAGcGT TTCACGCTCT TCTTTCGTAC GATATTGGTC 13980
 GTCATCATCT GATGAATGAG CTGTCATACG ACTTGTTACT GCTTCAATCA AAGTTGAACC 14040
 40 TTGACCAGAA ATAGCTCGAT CTCTTGCTTC TTTCATCGCT TTATACATTG CTAATGGATC 14100
 ATTACCATCT ACTTGTTTAC CATGTATACC GTAACCAAGT GCTCTATCCG ATAATTTTTC 14160
 AGCTGCGTAT TGTAATGAAT CAGGTACTGA AATTGCATAT TTATTATTTA TAATGACACA 14220
 45 TACAAAAGGA AGTTTGTGTA CACCCGCGAA GTTTAAACCT TCATGGAAGT CACCTTGTT 14280
 TGAGCTACCT TCACCAACAG TTGCTGTTGC AATTTTCTTC TTACCATCCA TTTTAAAGC 14340
 TAAAGCAGCA CCAACAGCAT GGGTATTTG AGTTGCTACC GGTGAACTTT GAGACAAAAT 14400
 50 ATTCTTAGCT CTACTACTAA AGTGTGATGG CATTGTGTTT CCACCAGAGT TAACATCGTC 14460
 TTTCTTTCCA AACGCTGATA AAAACGTATC ATACGCTGAG ATACCCATAT AAGTAACGAA 14520

55

EP 0 786 519 A2

	AATCTGAGTT GCTTCTTGTC CTTGACCACT TACAACAAAT GGAATTTTAC CTGCACGGTT	14640
	CAATAACCAC AGTCTTTCAT CTATTTTCT ACCTAAATCC ATCCATTTAT ATATTACTTT	14700
5	TAGGTCTTCT TCGCTAAGGC CTAATGATTT ATAATCAATC ATGTTAAATC CTCCTATTTA	14760
	TACGTGAATA GCTCTACTTT CTGCTTTCOA TCCTAATTCC ATCAACACTT CAGAGATGGA	14820
10	AGGATGTGCG TGTGTTGTTA GTCCTAATTC TAATGCCGAG CCATTCATGA ACTGTAACAG	14880
	TGATGCCTCA TTAATCAATT CTGTTACATG TGGACCAATC ATATTAATAC CCACAATTTT	14940
	TTCAGTTGAT TGATCAATCA CCATTCGCT ATACCCTTCG TTTGTGTCAT GGCTATCAAT	15000
15	CACTGCTTTA CCAATTGCTT TAAATGGTAC TTTAAAACTT TTAACCTTCA TTCCCTCTGC	15060
	CTTTGCTTGT TCAATGTTTA AACCGATAGA AGCAATTTCA GGTGTGGAAT AAATACACTT	15120
	AGGCATCATG TTATAGTTTA CTGGGATTGG GTTCCCCTCA AACATATGAT CAACAGCCAC	15180
20	AACACCTTCT TTTGATCCAA CATGTGCCAA TTGTAATTTT CCTATACAAT CACCAGCTGC	15240
	ATAAATATGT TTATCTTCAG TTTGTTGAAA TTCGTTTCGT AAAATATGTC CTGATGTTGa	15300
	AAGtTTTATT TTAGTGTTGT TTAAACCAAT ATCTGATGTG TTAGGTTTTT TACCAATCGA	15360
25	TAGCAACACT TTATCTACTT TAATTATGTC TGAGGAAATT TCAAACGTAA CACCATCTTC	15420
	GTTAACATTT ATATCAITTT CAGAAAGTTT TATTCCCTCA TAGAATTTAA CACCACGTGC	15480
30	TGACAATGAT TTTTTTAATA GTTGTGAAGC TTGTTTACTT TCAGTTGGTA AAATTCTTTC	15540
	ACCTGCTTCT ATAAGTGTTA CGTCAACACC TAAATCTATC ATCAATGATG CAAATTCAT	15600
	TCCGATAACA CCACCACCAA TAATACCAAT ACTTGATGGT AACGTCTTTA ATGATAATAT	15660
35	ATCATCGCTA GATAAAATTT TATCATGATC AAATGATAAG AATGGCAACT CTGCAGGCGA	15720
	AGAACCAGTT GCAATTAATA CAAATTGGTT GGGTAATAAG TCTGATTCAC CATCTTCATA	15780
	TTGACAGAA ATTGTGCCAC TTTGAGGTGA AAATATAGAT GTACCTAGAA TACGTCCCGT	15840
40	GCCATTATAA ATGTCAATGT GATTGTGTTG CATTAATGC TTTACACCTT GATACATTTG	15900
	ATTAATAATG TCTTCTTTTC GTGCCAACAT ATTTTCAAAA TTAACATTAG CATCTTTGAC	15960
	ATCAACGCCA AACATTGCTG CCTGTTTTAC TGTTTGAAAT ACTTCAGCAG ATTTAAGCAG	16020
45	CGATTTAGTA GGAATACAAC CTTTATGGAG ACAAGTACCT CCTAATAGTT GTCGTTCTAC	16080
	TATTGCCACT TTTTACCTA ATTGAGACGC ACGTATCGCA GCAACATATC CTGCAGTACC	16140
	TCCACCGAGA ACGACTAAAT CATATTGTTT CTCTGACATG TTCTTACTCC TAACTAATGA	16200
50	TATATATCCA TTGAAAATTT ATTAATACAT AGTTTTCATG TCCATTAATT ACCTATTTTA	16260
	CATGATTGTC TATTTAGTTT GAATGCACAT AAATAAATCC ATAAATGAGT ATTCAACACA	16320

55

TAAATCAGTA ACACTTGCAC CTGAAATCAT TCGTGCAATT TCATCTACTT TATCATCGCT 16440
 AATTAACCTCT TGAACCTGTG TTGTTGTACG ATCATCTTTT GATGATTTCG AAATTAATAA 16500
 ATGATGGTCG CTCATCGATG CAACTTGTGG TAAGTGAGAG ATACAAATAA CTTGTATATA 16560
 TTCTGCTaTA TCTCGCAITTT TCTCTGCCAT TT 16592

(2) INFORMATION FOR SEQ ID NO: 54:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13794 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 54:

CCAATACAAC GTAAAAAGAT TGCTTGTGTT ATTAATGAGT TAGATAAAAT AATTAAAGGA 60
 TTTAATAAGG AAAGAGACTA CATAAAATAT CAATGGGCTC CAAAATATAG CAAAGAnTTT 120
 TTTATACTTT TTATGAACAT TATGTACTCA AAAGATTTTT TAAAATATCG ATTAAATTTA 180
 ACATTCTTG ATTTATCTAT CTTATATGTA ATATCATCTC GAAAAAATGA GATACTAAAT 240
 TTAAAGATT TGTTTGAAAG TATTAGATTT ATGTATCCTC AAATTGTTAG GTCAGTTAAT 300
 AGATTAAATA ATAAAGGTAT GCTAATCAAA GAACGATCCC TTGCAGATGA AAGGATTGTG 360
 TTAATCAAAA TAAATAAAAT ACAATATAAC ACTATTAAAA GCATATTCAC AGATACTTCC 420
 AAGATTCTCA AACCAAGAAA ATTTTCTTTT TAAATTTAAA CAGATTTACC TCTTGATAAA 480
 ATAAATAAGC AATCATACTA CTTCTCAATT TAGTATAAAT AAAAATACAT AATTAACTTT 540
 CTTTGTGTTT TATATTATTT CAATACCCTA CTATATATCA CAACACATAA ATTAAGCATG 600
 ACACTCATT C AATTTAGTTC ACCATTTCGT GTTCCAATTT TACTGAGTAT CATGCTTTTA 660
 ATGTTATAAA CCTAATGCTT TAATAAATCG TGTTAATTCT TCTCGCATAC TGTCATCTTT 720
 CAATGCATAT TCTATGGTAG TTTTAACGAA GCCTAATTTT TCTCCAACGT CATAACGTTC 780
 GCCTTCGAAG TCATATGCAT ACACTTGGTT ATCATTATTC ATACGTTCAA TCGCATCTGT 840
 TAACTGAATT TCGTTACCTG CGCCTTCTTT TTGCGTTTTT AAATAATCGA AAATTTCAGG 900
 CGTTAATACA TAACGTCCCA TAATAGCTAG GTTTGATGGT GCCGTACCTT GTGCTGGCTT 960
 TTCAACAAAC TTTTTCACCT CATACTGACG TCCGTTTTTA GTTAATGGGT CAATAATTCC 1020
 ATAACGATGA GTATCTGCTT CCGGAACCTC TTGGACACCT ATAACGAGT GCCCTGTTTC 1080
 TTCATAAACG TCAATCAACT GTTTCACCTG TGGCACTTCA GATTCAACAA TATCGTCACC 1140

EP 0 786 519 A2

	TAAACCTTTT TGTTCTTTCT GCCTTACATA AAAAATATTC GCAAGTCCG TTGAATACTG	1260
	AACTTTCTCT AGTAATTCAG ATTTACCTTT TTCTTTTAAC ACCATTTCTA ATTCTTTTGG	1320
5	ACTATCAAAA TGATCTTCAA TCGCGCGTTT GTGGCGACCT GTCACTATAA TAATATCTTC	1380
	AATTCAGCT CTTGCAGCTT CTTCAACGAT ATATTGTATT GTGGGTTTAT CTAAGATAGG	1440
	AAGCATTTCC TTTGGCATCG CTTTAGTTGC TGGTAAAAAT CTAGTCCCTA AACCAGCAGC	1500
10	GGGAATGATT GCCTTTTTTA TTTTTTCAA AGTTAATGTG CTCCTTTTCC TAAGTATTAA	1560
	ATCTATGTAT CAACGTCATT TTAACACTAA TTAGAACGCC TTCATAGTGT CATTGAGTAT	1620
	GTAATTATTT CTTGGGAAAT TTGTTTAAAT TTTAAAAAAC AGGCTTACTT CATATAATTT	1680
15	ATGAAATAAA CCTGTCAATT TTGGATTGAT TATGCTTTGT GATTCTTTTT ATTTCTGCGT	1740
	AATAACGCTA AACCTAAAT GCTAAATAAT CCGCCGAACA ACATGCCGTT GTTTGTTGAT	1800
20	TCTTCTCCAC CTGTTTCAGG TAGTTCAGAT TTCTTAGATT GTGCTTTTTT AGTTGGTACC	1860
	ACTGCTTTAA CCTTTTCATT GATTTCAATA ACAGGTGTTA CTACTTTACC TTGTTCCACT	1920
	GGTTTAGAAG GTTTTTTAGG TTCTTCTTTA GCAGGTGGTA TTGGTTTACC AGGTTCAGTT	1980
25	GGTACCTCTG GCGTTGGCGG TGTGGTGTT TCCGGCTCGC TTGGTACTTC TGGTGTCGGT	2040
	GGTGTGGTG TTTCCGGCTC GCTTGGTACT TCTGGTGTG GTGGCGTTGG TGGCAGGATT	2100
	GGAGGTGTTG TATCTTCTTC AATCGTTTGT TGACCTTCAT TATGACCACT TACTTGTTGA	2160
30	AGTGTATCTT CTTCAAAGTC AACACTATTG TGTCACCGA ATTGATAATT TGGTTTATCT	2220
	TTATTTGTAT CTTCTTCAAT AATTTCAAGT TGCTTATTGA ATCCGTGAAT ATGTGGCACA	2280
	CTGTCAAGT CGATATCAAT GATATTACCA CCTGTTCAT ACTTAGGTTT GTCTTTCTCT	2340
35	GTATCTTCTT CGAATGATTG GTTACCATTA TTTTGACCAT GAATTTGAGG TACACTATCG	2400
	AAATCGATAT CTACGATATT GCCACCTTGT TCATATTTCTG GTTTATCTTC TTCTGTGTCT	2460
40	TCCTCAAATG ACTGATTACC GCTATTTTGG CCACCTTCGT AACCTAATC ACTCTTAATA	2520
	TCCACGTGGC TATTTTCTTC GATTTCTTCA ATCAGCCAT AATTACCGTG ACCATTTTCA	2580
	GTTCCATAAC CAGAATGAGA AATATGATGA TTGTTTTCAG TAATTTCTC GATTGGTCCT	2640
45	TGCGCTTGAC CATGTTCTTC AGGTAGTTCA TCTACTAGTT CAATCAGATT ACTTTCAGTC	2700
	GTATATTCTT TCGTATCTTC AATTGTTGTA TGATCGCTAA CAGCACCAGT TACAATACCT	2760
	TTGTAGAAT CTTGTCAAA TTCAACTAGG TTAGACTCAG TAGTAACCTG ACCACCACCT	2820
50	GGGTTTGTAT CTTCTTCATA TTCAACAACA TCAGCATGAT GTTTTGAATT TTCATGTGTC	2880
	GATTCTTCAA AGTCTACATG AATAGAATCT TCTTCAGTTT CAATGGTACC TTCTGCATGA	2940
55		

	TCTTCGATTG TACCAGTCAA TTCATGCTTC TCCACTGGCG GCTCTGATTT AAATTCAAGT	3060
5	TCGATAGGAG TACTATGTTC TATAATAGGT TCCTTTAGTT TATCTTTGCC GTCGCCTTGA	3120
	GCGTTATTAG AGTAAATGC AACGCCATTT TTCCaAGTTA AATTACTTGT ATAATAATAG	3180
	TTATAATATC CAAAAAGGTG TGTTCGAAAT TCTAAGTTGC TAGCATTGTA ATCATAATAC	3240
10	CCTTCATATT TTATTACATA ATTTTACTT TGGTCTAAAT TATTAAAGTT TAAAGAATAA	3300
	CCACCATTAG TATCAAAATC TAAACTCATA TTATCAGTCA CATCTTCAAA TTTGCTGACA	3360
	TCATCAAGCT TTGCATAnTn AgctTTCAGC TAAATCGTCT GAACCAATGT GTTTATATAC	3420
15	CTTAACTGTT GGATTATTAA CCCCTGGTTT ATTCCTTTA GTTACTTGAC CAGTTACTGT	3480
	CACAGAGCTT AACGACTGGT TGTTAGGTTT CATGTACGCA AAATGACTAA ATTTCCCATC	3540
	TACTTTATTT AAAGTATCAA TTCGACCATT AGCTGTTACT CCCCAATTAT CTCTAACTCC	3600
20	ACCTAAATAT TGAATATTAA ATATTTTGCT AACCGTAGTC TCACCCAATT TAACTTCAAC	3660
	ATTTTGGTTA CCTTTTTCG TCACTGTTGT AGGATCAATA AATAGATTTA AAGATAATTC	3720
	AGCAGTTAA TCTTCTTTT CTTGTACATA TTCTTTAAAC GTATATCTAA CTTTCTTTC	3780
25	TCCAATTATT TCTCCTGTCG CCATAACTTG ACCATCTGTA CTTTTATCT CCGGAACTTT	3840
	ACGCAGTGTT GAGATACCAT GAGTTTCAAC ATTATCGCTT AATGTGAAAT CAAAATAATC	3900
30	TCCCGCCTTA ATTCCTTCTC CAAATTCCA TTTATATTC AAGGTTACTC TTTCTGCGTT	3960
	ATGAGGATTT ACAACATTCG TATCTTGTTT ATGTCCTACA ATTTCACTAC CTTCTTCTAC	4020
	TTCCACTTTA TTTGTTACAT CTGTACCTGT CGCTTAGTT TCTTCCACTA CTTCTTCTC	4080
35	TGCAACTGCT GTAACGTCat TGatCTTTT ATTCTTGTT TAATTTCTGA GACGTTACTT	4140
	GGTTGAGCTA TGTCAACTTG AGTTCCTGTA GTTCCTTAT CAGCAACTTT TTCCGATGGC	4200
	AAATCAACTC GCGAAgTTTC TACTTTTGGT GCTTGCAcAG TTTTCGGTGC TTCTTCTGTT	4260
40	GTTACTTGTT TTGATTGTGA TGGTTGCTCA GTTGATGTCG CGCTGTATGA TTGTGTTTCA	4320
	TCTATTGTAT TAACGTTATT TGTAGTTGTT TGTGTTTCGC TTGCTTTACT TTCAGTAGCT	4380
	GAACTCCAC TTTCCTCTAC TGTAGTATTG TTTTGTTCG ATGCTGCAGC TTCTTTTCT	4440
45	TGTCCCATTC CAACAACGAT CATTGTTTCCT AAGAATACTG AGGCCGCTCC CAATTTGTGT	4500
	TTTCTTATGC CGTATCTAAG ATTGCTTTTC ACTATAATAT TCTCCCTTAA ATGCAAAATT	4560
50	CATTTATTTT TAAAACTCAA TAAATGCAAT TCTATATTGT TCGGTTTTTA AAAGCAATGA	4620
	AAAAAAGCGA GTTAATAAAA AGTTAAGATT GTTGTTAACT TTATGTATAA TGAGTTTTTT	4680
	ATTATTGAA ACTCACATAT ATATTGCATA CAAAGCTCTT GAACACCTTG ATATAACAGG	4740

55

EP 0 786 519 A2

TACTAAACCA TACATAATAA TCGCCTGTAC AATGCATCAT TAACAAGTCA CTGAAACGCC 4860
 TTTTCATTGTA TTAATAACGT CACTATAAAT TTTATATCGT TCGGTTTTTG TTTGATTTTA 4920
 5 ATGATTATTT ATACAAAAAC AGCCGTATTT CAAGCCGACA TTTTAAATTT AACTAAATTT 4980
 GCATCTAGTT AATAATTGCA TTTATCAAAT TTGTCTTATT GATCCAATCT AATTTGTACT 5040
 CACAACTAG TTTAAAATTC TAACTTTATC TCTCAGTTCG TTATCAATCA TCAGACATAA 5100
 10 ACCAATGAAG CAATCAGAAA ACACTCTAAT TTTCTATTAG AAATTGATT TAATATAAAA 5160
 AAACAGGCTT ACTTCATATA ATTTATGAAA TAAACCCGTC AATTTTGTGTT TAATTATGCT 5220
 15 TTGTGATTCT TTTTATTTCT GCGTAATAAT GCTAAACCTA GAATGCTGAA TAATCCGCCG 5280
 AACACATAC CTTTGTGTTG TGATTCTTCT CCACCTGTTT CAGGTAGTTC AGATTTCTTA 5340
 GATTGTGGTT TTTTAGTTGG TGCCACTGCT TTAACCTTTT CATTGATTTC AATAACAGGT 5400
 20 GTTACTACTT TACCTTGTTT CACTGGTTTA GAAGGCTTTT TAGGTTCTTC TTTGGCAGGT 5460
 GGTACTGGTT TACCAGGTTT AGCTGGTACC TCTGGTGTG GCGGTGTTGG AGTTTCTGGC 5520
 TCACTCGGCA CTCTGGTGT CGGTGGTGT GGTGTTTCCG GCTCACTGG TACTTCTGGT 5580
 25 GTTGGTGGCG TTGGTGTTC CGGCTCACTT GGTACTTCTG GTGTCGGTGG CGTTGGTGGC 5640
 ACGATTGGAG GTGTTGTATC TTCTTCAATC GTTTGTGAC CTTCATTTTG GCCGCTTACT 5700
 TTTGGAAGTG TATCTTCTTC AAAGTCAACA CTATTGTGTC CACCGAATTG ATAACCTGGT 5760
 30 TTATCTTTAT TTGTATCTTC TTCAATAATT TCAGTGTGCT TATTGAATCC GTGAATATGT 5820
 GGCACACTGT CGAAGTCGAT ATCAATGATG TTACCGCAT GTTCATACTT AGGTTTGTCT 5880
 TTTTCTGTAT CTCCTCGAA TGACTGATTA CCTTTATTTT GACCATGAAT TTGAGGTACA 5940
 35 CTATCAAAT CGATATCTAC GATATTGCCA CCTTGTTCAT ATTTAGGTTT GTCTTCTTCT 6000
 GTGTCTTCCT CGAATGACTG GTTACCGCTA TTTTGGCCAC CTTCATAACC TAATTCACCTC 6060
 40 TTAATATCAA CGTGGCTATT TTCTTCGATT TCTTCAATCA CGTCATAATT CCCGTGACCA 6120
 TTTTCAGTTC CTAAACCAGA ATGAGAAATA TGATGATTGT TTTTAGTAAT TTCCTCGACT 6180
 GGTCTTGTG CTGACCATG CTCTTCAGGT AATTCATCCA CTAATTCAAT CAGATTACTT 6240
 45 TCAGTTGTAT ATTCTTTCGT ATCTTCAACT GTTGATGAT CGCTCACTGC GCCAGTTACA 6300
 ATACCTTTTG TAGACTCTTC GTCAAATTCA ACTAAGTTAG ACTCAGTAGT AACCTGACCA 6360
 CCACCTGGGT TTGTATCTTC TTCATATTCA ACAACATCAG CGTGATGTTT TGAATTTTCA 6420
 50 TGTGTAGATT CTTCAAAGTC AATTGGATTT GATTCCTCAG AGGACTCAGT GTATCCTCCA 6480
 ACGTGACCTG CTCGCTATC CACAGCAGTA TGGTAATCGA TATCAATAGC TGATGAATCC 6540

55

EP 0 786 519 A2

	TGGTAATCAA TGTCAAGAGT TGATGAATCA TATTCCTCTT CAACAGTAGT TACTAAATTC	6660
	TTATCATATT GACCTGTAAG AGTTTCTTTA ATTGTATCTT CTTTATATTC AAATTTATTA	6720
5	TTTTGAATAA TCGGACCATT TTTCTCATTT CCGTTCGCTT TATTACTGTA TAAAACTAAA	6780
	CCATTATCCC AAGTTAAGGT ATATCCTCTA TCATAATAAT ACTTATAAAG TTGCTCTGGA	6840
10	TGTCCTACCA TTTGTGTTCT AAAATCAACT TCATCAGTAC CATTTAAATA CTCTCCATCA	6900
	TAGTGAACAA CATAAGTTTT ATCTAGATTT TCTATATTCA ATGAATAGCT TCCATTATTT	6960
	TGTAAATTCA AATTCCCACT CATATTACTT GTGACTTCTT TAAATTTAGA AGTATCTGTC	7020
15	GTATTTGCAAT ATACACTCTT CGCTATGTCT TCATTATTAC CCAAGTATTC AAATATCCTA	7080
	ACTTTTGTTT GATTTCCATT CTGATTACTA CCTTTCATTA AAGTTCCAGT AACAGTCACA	7140
	CTTGTCGTTT TACCATTATT AGGTTTAATA AATGCAACAT GCGAAAATCT ATTATTGCTT	7200
20	TTATTAAATG TCTCAATCGA TCCATTTAAA TTGGCATAAT AATTCCCAAT ACCATCTTTA	7260
	TATTTAACAT CTAATTCCTT TGAAGTTTGT TCTTCATTTA GTGTTGAAGT TATAGTTTGA	7320
	TTTCCATTAG TTTGTACAGT TTTAGGATCA ATAAATAAAT TAATTTCTAG TTCAGCCGTT	7380
25	ACATCAACCT TATCTTCAAT ATCATTTGTA AATGTATATC TAATCTTTCC ACCTTCTAAA	7440
	ACTTCACCTG TCGCCATTAC GACTGAACCA TTTTAAATTT CTGGTACTTT TCTAGCAGTT	7500
	GATACGCCAT GCGTATTTAC ATTATTTGAT AAAGTAAAGT CAAAGTAGTC ACCTTGATGT	7560
30	AAACCATTCT CAAATTTCAA CTTATATTTT AGTACCGCTC GTTGTCTGTC ATGAGGTTCT	7620
	ACTTTATTTG TATTGTTATG CCCCTCAATA GAACCAATTT CTAAGTAAAC TTTACTTGTT	7680
35	ACATCTGTAC CCGTTTCCAC TTTGCGGTTA CTAGCTTCCT TAGCTTCCGC TACATCTGCT	7740
	GATCTTGTC CACGTGGCTT ACTTCTGAT GCCGTTCTTG GCTGTGCCAC TTCAACTTGT	7800
	GTTTCTGCGA CTTGATTTTG TGTAGCCTTT TTAGGTGTTA AATCTACTTG TCTTTGATCT	7860
40	CCGCTATTGT CTTGAGATTG TGTGTTTCC TTAAGTTGAG GTTTCGCTTC TTCCTTAACT	7920
	ACCTCTTCTT TAACTGTTTC TATATTTGCT GGTGTGTCAG TTTGTGCTGC TTGTACTGCT	7980
	TTTGGTGCTT CTTCAAGTTG TACTTGTGTT GCGTTTGACG GTTGTCTGCT TACTGTGCG	8040
45	TTATATGATT GAGTTTCTTC TATATGATTA ACGTTAGTTG CAGTTGTTTG TGTTCACCTT	8100
	GTTTTATTAT CAGTAGCTGA ATTCCCATTT TCTTCTACTG TAGTTGTCTT TTGTTCTGAT	8160
	GCTGCAGCTT CTTTGTCTTG TCCCATCCCA ACAACGATCA TTGTTCTTAA GAATACTGAT	8220
50	GCTGCTCCCA ATTTATGTTT TCTAATGCCG TACCTAAGAT TGTTTTTCAC TATAATATCT	8280
	CCCTTTAAAT GCAAAATTCA TTAATTTTTT AACTTAATA AATGCAAGTC TATATTGTTT	8340

55

EP 0 786 519 A2

	ATGTTAATTG ATAATTTTAT TATTTGAAAT ATACCTATAA ATTGTATTCA AGTCATCAGA	8460
	AACCCTTGTC ACACAAGGCT TGTATTTTTT ATACTTATTT TTAAATTAA ATTCATCATT	8520
5	ATCTAATTTA AAACAATATA CTAAACGTTT CATAATTATC GCCTGTACAA TACGCACAAA	8580
	AACATGTCTT GAAACGCCTT TCATTACTCT AAAATACCCA ATATACTTTT TATATCGTTC	8640
	GGATTCTGAG TATTTCTAGAC GATTTTCTGC ATAAAAATAA ACGTGTTTCA AGGCAATATA	8700
10	TTGCAATTAC CTAAAAACAC GTTTACTTAA TATTTAGTTA AACAAATAAG CTAATGAATA	8760
	AAATGAAGAT GATACCTGAA ACGGAAATAA TCGTTTCTAA TAATGACCAT GTTAAGAATG	8820
	TTTCTTTTAC AGTTAAACCA AAATATTCTT TAAACATCCA AAATCCTGCG TCATTTACAT	8880
15	GAGACAAAAT CACACTACCT GCACCTATCG CAAGTACAAC TAATGCAACA TTTACATCTG	8940
	ATGATTGTAA TAATGGTAAG ACAATACCTG TAGTTGAAAT CGCAGCTACT GTAGCCGAAC	9000
20	CTAATGCGAT ACGTAGCACA GCTGCAACAA TCCATGCTAG TAAAATCGGA GACATCTCTG	9060
	TACCTTCAAA CATTTTAGCA ATTGTATTTT CGACACCGCC GTCAATTAAT ACTTGTTTAA	9120
	ATGTACCGCC ACCGCCAATA ATCAATAACA TCATTCCGAT TGGATAAATC GCATTGTC	9180
25	CTGATTCCAT AATATGATTG ATCTTACGCT TTCTCATTA TCCCATCGTA ACGATTGCAA	9240
	ATAATACTGC TATTAGCATG GCTGTCCCTG CTGTTCTTAT CATATAAATG ATAGATTCAA	9300
	ATAGATTGTG AGGTTTGTCA TGCCCAGTTA CAAGTTGCGT TATCGTAGAC ACTAACATTA	9360
30	ATATGACTGG TAATGTTGCT GTTAATAAAC TCATACCAA TCCTGGCATC TCTTGATCCG	9420
	TAAATTCTTT TTGTGCACCT AACGCTGAAA TATCGCCTTC TCGTGTATAC GCAGACGGAA	9480
	TCATTTTTTG TGCACTTTGT TAAATATAGG CCCTGCAATG AGTGTAATG GaATGGCAAT	9540
35	AATCATACCA TACAGTAATA CATCTCCAAC ATTTGCCTTT AATTCTTTTG CGATGACTAC	9600
	CGGFCCTGGA TGTGGTGGTA AAAAGCCATG TGTCACTGAT AAAGCTGTTA CCATAGGTAG	9660
40	TCCTAGTTTT AACACTGAAA CATTTGCGCG TTTTGCTACT GTAAATACTA ATGGAATCAG	9720
	TAAGACTAAA CCTACTTCAA AGAACAATGC AATACCGACG ATAAATGCTG CAACAAGCAT	9780
	TGCCCATGTG ACATGTTTTT GACCAAATTT TTGAATCAAC GTGTCTGCGA TTCGAGTTGC	9840
45	ACCACCACCA TCAGCAAGCA ATTTCCCAAG TATGGCACCT AAACCGAATA TCAGTGCAAT	9900
	GTGGCCGAGC GTACTGCCCA TTCCTTTCTC AATCGTCTCC ATAATTTTAG TCAATGGTAT	9960
	ACCTAGCATT AACGCTGTAA TCATCGATGT GATAATTAAT GAAATAAATG TATTTAATTT	10020
50	AAACCCAATA ATTAATACTA ATAAAATAAC GATACCTAAA ACAACACTGA TTAACGGCCA	10080
	TATTTGTTA AACATGACAT TCCCCTCTTT CTCTTTTCAA TAGAATGTAA CACCGTCGTC	10140

55

EP 0 786 519 A2

	GAGTGACGTA TTTATTGTGT TTTATTTTCA GCGATATGTT GCGGTTGAAA ATCTGCAATT	10260
	TGTTCATAAT TCTCTGTAA AGAACGACTT AAATTGATAA AAATGGATAC GATCTCTTGG	10320
5	TAAACAGTGA CATTTTCTTC AATCGGCGTA TGATTGTTTG TGGCACCGAC CATCGATGAA	10380
	ACGATTGAAA AATCTTCAAT GTCACCTACA GCTTTAAGTC CGAGCACGCA GGCACCTAAG	10440
10	CATGAACTTT CATAACTTTC AGGAACCACT AACTCTGTGT CAAATATATC TGACATCATT	10500
	TGACGCCATA CTTCACTTTT CGCAAAACCA CCTGTTGCTT TTATCATCTT AGGTGTTTCA	10560
	TTCATTACTT CAATAAGCGC AAGATAGACG GTATACAAAT TGTAAGAAGC ACCTTCTAAT	10620
15	GCAGCGCGAA TCATATGTTT TTTTATATGA GATAAAGTTA AACCAGAGAA TGAACCTCTT	10680
	GCATTTGCGT TCCAAAGCGG CGCACGTTCT CCTGCTAAAT AGGGATGGAA TATTAAACCA	10740
	TCTGCACCTG GTTTAACACG CTTTGCAATT TGAGTTAAGA CATCATAAGG ATCAACACCG	10800
20	AGACGTTTCG CAGTTTCGAC TTCACTCGCT AGCAACTCGT CGCGCAACCA TCTCAATACG	10860
	ACACCACCAT TATTTACAGG ACCTCCGATG ACGTAGTGGT CCTCTGTTAA GACATAACAA	10920
	AATATTCTAC CTTTGTAAATC AGTACGCGGT TTATCTATCA CAGTACGAAT CGCCCCAGAT	10980
25	GTACCGATTG TGACAGCAAC TTCTCCTTTA CCAACACTAT TGACACCTAA ATTAGAAAGG	11040
	ACCCCATCAC TCGCACCAAT AACAAACGGT GTATCTTTAT TAAGCCCCAT TAATGTTGCA	11100
30	TAACGTTCTT TCATACCTTT CACACATAC GTTGTTGGAA CTAATTCCGG CAACATTTCC	11160
	TGGAATAAC CCAGCAGTTC TAATGCCTCA ACATCCCAAT CTAATGTTTC TAAATTAAAC	11220
	ATCCCTGTTG CGGAAGCCAT TGAATAATCA ATGATATATG TATCAAATAA ATGATAGAAA	11280
35	ATGTATGTTT TAATATCTGC AAACCTAGCA GTACGTTGAA ATACATCTTG CCATTCATGT	11340
	TTCATCCAAA AAATCTTCGC TAATGGCGAC ATAGGATGAA TCGGTGTGCC TGTTGCTG	11400
	TAAATCGCAT TGCCATCATG CACTTCATTT ATTACTGTTG CATATTTTGC AGCGCGGTTA	11460
40	TCTGCCCAAG TAATATTATT TGTTAATCTT TGATGTTGCT GATCCATCGC AATCAAGCTA	11520
	TGCATTTGCG CACTAAATGA CACAACTTA ATGTCGTCTT TATTAACCTT GGATTCTCTC	11580
	ATAACATATT TAATAGTCAT TAGTACTGCA TCAAATAATT CATCTGGGTT TTCTTCTGAG	11640
45	ACATCAACGT TTGGTGTGTG TAAATCATAG CCTATTTGAT GTTTCATGAT AAAAGTTCCA	11700
	TTTTCATCAT ATAAGACTGA CTTGGTACTC GTCGTTCCAA TGTCGACACC AATCATATAT	11760
	TTCATGATAA ATCCTTCTTT CTTTCATTTT AATTCAACCA AAATCCTTCA ATATCTTTAC	11820
50	CAACATCGTC GAAATTTAAA TGAAACGCTT CTTTCAAAT TTGACTGTCG TATTGTTCCA	11880
	CTGCATCAAT AAACACTTGA TGATTATGAT GTATGCGTTC AAAATCTTGC GGGTCTGTT	11940

55

EP 0 786 519 A2

	AAAATGAGTT TAAATATTGA TGATTAGATG CTTTGATTAA TGTTTCATGA AATTCAAAGT	12060
	CATGCTTCGT AAATGATTCT GCATCCTCAA ATTTTACTGC CACTTTCATC AATTCAAGTT	12120
5	GTTTCTTCAT TTCTTTTACG ATAGGTAGTC GCTCTTGATT TTAACTCTT GAAAATGCAA	12180
	ATGACTCTAA CATCAGTCGC AAATCATACA TTTCTTTCTT TTCTTGTTCC CCAAACGGCA	12240
	ACACATGTGC ACCCATTCTT TCTAATTGGA TGAGTTGATT TTGTTGCAAT AATTTAAATG	12300
10	CATCTCGAAT TGGCGAACGA CTCACATTAA ATTGCTTTGC CATTTGATTT TCAGTGAGTA	12360
	ACGTACCTTC AGCTATGTGA CCATTACAA TGCCTAAGCG TAATTCTGCC GCGATACCTT	12420
	CTCCAGTTGT CATACTTCC AACCATTCTT CTGGATATCC ATACATCATC AAAGTCACTC	12480
15	CTTCATTACA CGACATACTT GTATACAAGT ATGTTAATAT AGTTATTATG AGTTTGCAAG	12540
	CGCTTTCTTT ACGAGCACTA AAATAGTGAC CACCCCTTTT CGATTTAAAT TTAAAGGAAA	12600
20	TGGTCACTAT CACACGAATG ATTTAATTGT TATGTTGTAT GTGGGATATT TCTAATTGTT	12660
	CTGTACTCAT ATGCGCTTTA GGTACTTCAA TGCAATAATG CGTTTCATGA CAGTTTGGAC	12720
	ATTCGAATCG ACGTGTGTC GCTGTATGTT TCGCTTGTAT AACTGCCCAC AAAGATGGTG	12780
25	AGAATATATG CTGGCAGTTA GGACATAAAT AGGCAACCTT TTGTTGGTAA TAAAAAGTAA	12840
	CACCAATGCC ATAACCAATC ATAAATGGTA AAGCAATTAA AAACGGCCAT TTATTTTTC	12900
	TCAAAATGTC ACTTATAATG CTAGAATATT GAATTATTCC TATAATACCA GCACTAATCC	12960
30	AAATGTTACG ACGAATACTT TTCATTTTCTG CTGATTTACT CATGACATGC TCTATGTCTT	13020
	TTAAGTGTGT GATTGGAGAC GTCGACGCTT CATTTACGTA ATATTGAACA TTTTAAATTT	13080
35	TGTTTAAATAC CGCTTGTTGC TGTTTAACTT GTTGGTTAAT TTCTTGTTGT TTCATAGTTA	13140
	GTAAAGTATT GAGCGTCTTC AAAGTACCTT CACCTTTTAG CAACATATCT ATATCGCTTA	13200
	ACGCACAACC TAAATCTTTA AGCAATAAGA TTAACCTTAA TGTTTGTCGC TGTTGTTCTG	13260
40	TATACACACG ACGCTTTCCT TCTGTAAATC CTTGTGGTTT CAAAATACCT TTGCGATCAT	13320
	AATATTGAAT CGTTCGTGTT GTCACATTGC ATAATTTTGC GAGTTCTCCA GTCGAATAGT	13380
	TAGACATAGA TTCCACCTCC TATAATTACC ATAGTTGATG ACCCGACGTC ACGAGCAAGT	13440
45	ACAATTTCCA CATTTTAAAG AAATTTATTA TACTAGGCGT CTTATTTTAA TGATTTTCGTA	13500
	CCATGTTGAT TTACAACTC ACTCAAATA AGTAACACAC CTAATAACA TCTACTCTGT	13560
	TATTTCAAGAA TGAATTTGTT GTAATTTATC TTCAACTTCA GTAATCTCTG TCGCACATTC	13620
50	TTTCAGTAAA TCTCGATACT TTTCCGTCTC TGCATTGTTT TTATAACGTA TTTTATGTTT	13680
	TAAACTTGcC CACATATCCA TACCTATCGT TCTAATTGA ATTTCAACAG GCAATACCTC	13740
55		

(2) INFORMATION FOR SEQ ID NO: 55:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1059 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 55:

GGATAAGTTC AGGTAAATTC ATTTCTTTTT CAATTTTGAT TTTCATTGTT TCCGCCCTTT	60
TAAAATAAAG TTAGTTGCTT CTGTTCTCTCA TATTCCAAAT CACTTTGCTT TATATATGTT	120
TCAAGCTCTT CCGCTGTATC AAATGTCTTT TTCACACCTT GCCAACCTGG CACGATATGA	180
CCGTGAAAGT AATAAGTGCC ATTTACTACA TGGATATGTG CCACTCGTTC GTTATCCTGA	240
TACAGATATC TCTTAGATCC AAAGAATTGA TTTAGGTATT CTTTACGCGC GCTATCTGTC	300
ATGGTCATCA CTCCTTTTAA CAATTAGGCA GACCAAACGA CATGCATTCTG TCGTATAGCT	360
CTTCATTACT TATGCTTGCC TTATAGTTTT CAATCACATT GCTAACTTCT TTATGACTCA	420
TTGCTTTAAC TTGTTCTGCT GTATATTTTT CGCAGTCTTC TAATTCCAGT TGCTCCTGTA	480
ATGACATCAC ATATTCAACT TGTCTTTGGG TTGCCATCGT TAACCCTCCC ACAAGTCAAA	540
AGCTCTTTGG ACGTAAAACT TCGCCTTTGC TAAATCCTCA TGACCATTCT TTAACGGTGC	600
TCTAGACATG TATTTGATTG CATTACCTAT TGCGAATGCT AGTTGAGGTG GATACTGTGC	660
CGTAACCTGT TCGATAAAAT CTATAATTTC AATGTCGCCG TATGTGTAGT GCGCTGGTTG	720
CCTAACATTG TCTTGCCTT CGTTCATATC TACTTTTCTG TTAAGTATTA CGCTCATTAT	780
GCTTCACTCC ATTTCTTGAA CATTGTTGTA TAAGTGACAT CGAACCAGTA CGGATCACGT	840
GAATGTTTTT GTGGCGTTCC ATCATAAAGC CATGGTCTTA ATCTTCTCTT TCTTTCCTGT	900
TCATATTCCG CTCTCACATT TCGTTGGTAT CGGTTCAAAA TCGCTTTTTT TCTGATTTTT	960
TCTCTCCCTT TTTCTTCATC TTTnATtTGA CTCTnCATAT ATTCAACTTC TTCTGTAGAT	1020
nTTGAGTCCT TTCTTCACA CAATAATTCA nCGCCGCGC	1059

(2) INFORMATION FOR SEQ ID NO: 56:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30246 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

EP 0 786 519 A2

	GAAGTAAAAG AAGAATTAAA TTTAACATTA ACAATGGATG AAATTGAATA TGTCGGGACA	60
	ATTGTAGGTC CTGCATATCC ACAACAGGAT ATGTTAACTG AGTTAAATGG ATTTGCGGCA	120
5	TTAACCAAAA TCGATTGGGA AAACGTAAC TCAATAATG AAATTACGGA TATACGCTGG	180
	ATTGATAAAG ATAATGATGC GTTGATTGCG CCTGCTGTCA AAGTTTGGAT TGAAACTTAT	240
	GGTGGTAAAC ATGACAAATA ATGACACCAT CATGTTACGA CATTATGTCC CACAAGATTA	300
10	TTTCGATGTTA GAAGCTTTTC AATTAAGTGA AAGTGATTTG AAGTTTGTTA AAACGCCAGA	360
	GGAAAATATT ACAGCTGCAA TGTCTGATAA TGAAAGGTAT CCCATCGTTG TAATGGATGG	420
	CAGGCAATGT GTGGCCTTTT TTACATTACA TCGTGAAAAA GGGGTGCGAC CATTTAGCGA	480
15	TAACCAAGAT GCAGTATTTT TCAGGTCATT TAGTGTTGAT CAACGTTATC GTAATAGAGG	540
	AATAGGTAAA GTGGTAATGG AAAAATTGGC GTCATTATC ACTTCAACAT TTCAGGATAT	600
20	TAATGAGATT GTGTTAACGG TTAATACTGA CAATCCACAT GCCATGGCAC TTTATCGCCA	660
	ACAAGGATAT CAATATATGG GAGATAGTAT GTTCGTCGGA AGACCTGTTT ATATTATGGC	720
	GTAACTATA AAATAAATTA AATTTAAAAG CATCTTTACT CATCGTCGAC CACAACAATT	780
25	AATGATGAAT AAAGGTGCTT TTTGTTATAG ATCATCGGAC AATTTACTAT AGTAAAAAGC	840
	GACCTAGTGA ACAATTGACA TATATCCACA GGTGCTTAA CTTAAGTTAT ATTGCTAGTT	900
	GCGATTAATT GATAGACTCA TCATTTTTGC GCTGTCGAGA TGGTCTTTTT ATTAAAAATG	960
30	CCGTAATCCA AGCCGTAATC GGAATACTGA TTGCAACGGC AATACCGCCT AAAATAATAG	1020
	AAATAAATTC TTGGGCAAAT ATTTTCGAGT TTATAATATG ACCAAATGAA TATTTAAGTT	1080
	TGAAAAACCA AATAAATAAA GCAAGTTGGC CACCAAAAAA GGCAAGGTAA ATCGTGTTCG	1140
35	CAGATGTCGC TAAATTTCT CTACCAACAC GCATGCCAGA TTGGAATAAT TCGTATTGCG	1200
	TAACGTTgGA TTCACTTGAT GCAATTCATA AATGGGTGAA CTAATGGTAA TTGTAAATC	1260
40	TATCAGAGCT GCAATAACAG CAAGAATAAT AGTGAACACC ATAAATTGAA CCATATCAAT	1320
	GCCAATATTC ATTGAATACA CATATGTTTC ATCTTGTGT TCGGTTGaaa AGCCTTGTAG	1380
	ATGACCGAAG TAGACCGATA AATAAATGAG TGTAATCAAC AATATTGTTG TAACGATagT	1440
45	GctGgATAAA TGCaGCTTGT GTTTTAACAT TGTAATATT GAGTACGAAT AAATTACAAG	1500
	CGCCAATAAT AATGCAGAAA AAGAATGTGA CGACATAAAT CGGTACGCCA AAAATAATCA	1560
	ATACAATACT AATAATTAAA ATAGCGAAAT TTAAAAATAG GGTAAATAA GAGATGAATC	1620
50	CCTTTTTACC TCCGAAAATT ATCATCAGAA AGAGGAGCAA TAACGCCAAT ATAAATACAG	1680
	CATTCATTGT TTCGCCCTCC TTAATGTTTC AAATATTTCC ATAAACAATA TTGTGATAGG	1740
55		

EP 0 786 519 A2

	CATCGAAATA GTATAAGTCA CTGTATTGGC ATTTTMTAAA AAGATTAAAA ACATAGGTAG	1860
	TGCACCGGAT AAATATGAGA ATAATAAGAT GTTAGTCATT GTTCCCATAA TATCTTGGCC	1920
5	GATGTTTCGC CCAGCAAGCG CCCATCTCCT CATTGAAATG TGTGGCGTAC GCTGTAAAT	1980
	TTCATGCATA CCACTAGCAA TTGTAATTGC AACATCCATA ATAGCGCCAA GTGAACCTAT	2040
	TAACACTGAG GCTAGGAAGA TATCTTTCGG TGGTAATGAT AAAAAGTTCA TCGTTTCATA	2100
10	TTTAATGCCT TTACCATCTG TCATATATAT GATTAATTCT GTTAAACCTA TACTCAAAAA	2160
	AGTTCGGATA ATTGTACTGG CTATGGTAAT GAGTGTACGC ATATGCCAGC CTGTAACGAG	2220
	CAATAAAGTG AGTATTGTTG AACAGATCAT GGCAATGGTC ATGAGTAAGA ATAAATTAAT	2280
15	ATTGCTATGT TGAATATGAA TGTAATTGC GATTAATATG GCAATAGAAT TCAAGATTAA	2340
	CGATAAAATC GATTGCAGTC CGACTTTGCG ACCAACCAAT AATACAGTTA ATAAGAACAA	2400
20	ACCAGTGATG ATAACCGTTA AGGTATCAGC CTTCTTTTCT ATAATATAAG CATCACTCGG	2460
	CTTGTTAGAA ATATGTAATA ATACTTTTTC GTGTGTGCGA AATGCCTCAG AATCTGCTTG	2520
	CGATTTGACG TACTGATGAT TAATCGTCGT CGTTTCTCCA GCAAATTGAC CATTTAATAT	2580
25	TTTGACTTTT AATTGATTTT TATATTTAAT ATCAGGATTA TTTTGTGCAT CTTTTGTAGG	2640
	TGTCGAAGAA ACATGTTTGA CATCTATAAT TTGACCAATT GGTGTGTGT AAAAGTTCTC	2700
	ATTATTGAAT GTAAATAAAA TAGCACCAAT GAATGCGATG CAGAACAAAC CTAAAATTAT	2760
30	ATTAAATGGC TTGTAAATA AATTTCTATA TTTCAAAAAC AAAACCCCAA TTCTATGAAT	2820
	GAATTAATAT GGTGATTATA CGCCCTTAAT TTTTATTTT CAAAGATATT ACTGCTAAGT	2880
	GTAAAACGAA AATCATCATT GATAGCATCG AATTACTTAA TGGAATGTAG ACGTTTTAGT	2940
35	CATTAATTGC TGAATAAGTG TTAATAATAT GCCAATATCA CTCTTTGTAT AAGGCTCCTT	3000
	TGTAATAGCA CATATCGTTC TTTTAAATTC AGTATGATCT AATTTTATAT CTATCCATGA	3060
40	TTTAGATTCT GGTAAATGTA TATTTTGTGA TGAAATGATG TAACCTTCTT TTTGACGAAG	3120
	GAGATACTGC GCAAGTGGTT GGCTACTGAT TGTGTATACA TCTGATTAG TAATCTTGGC	3180
	CAATTGTTTT TTTACAGTTT CGGCAAATGG TGCCAAGCAA TAAATATGAC TATGCTCAAA	3240
45	CTGAATTAAT GGTGGGTGTG TCGCCATCGT AATTGGATCG TCTGAAGGCG CATATAAATG	3300
	ATAGTGCTCT TCGAATAAAG GTAGCATATG TAATTGTTTG TGTTTACGTA TTTCTGGTGT	3360
	AAGTCCGTG AAACCAATGT CTATATTCCC ATTTAATACG CTATTTATAA TTGTGTCATG	3420
50	TTCTAATAAG CTCGGTATGA CATGTGTATC ATTTTGTAAG TGAAACGTTT GGATAAGTGG	3480
	TAGTAACATG TGGGATACGT CACTCTCATC ATAGCCAATG TAGATACTTT TATTTTATAGT	3540

55

EP 0 786 519 A2

	TTCAATAAAT AATAATTTCC CTTGAGATGT GAGCGTAATA TTGCGTCCTT GCTTTTTTAAA	3660
	TAAAGACACA TTAAGTTCTT GTTCTAATAA TGTAATTTGA CGGCTTATCG CTGATTGAGC	3720
5	AATGTTTAGT TCAAGTGCTG TTTGCGAGAT ATGTTCTCTT TTAGCGACCT CGATAAAATA	3780
	TCTTAATTGT TTAATTTCCA TAGCGATATA GGCACCTCCA AAAATGAGTG TTTTGTAAC	3840
	ATTATAGCAA TATTATTGAT AAATGTTCTA TTTTTTAGAT GAATATCTTC TATTTTATAT	3900
10	ATTGAACAGA TAAATTTTTT AGATTATAGT AATTATCATT AATAACTAAT ATCAGAATAT	3960
	TCTAAAAAAG GGGTGTGCAT CATGCACAAT GAGAAATTAA TTAAAGGCTT ATATGACTAT	4020
	CGTGAGGAAC ATGATGCGTG TGGTATTGGT TTTTATGCCA ATATGGATAA TAAAAGGTCT	4080
15	CACGACATCA TTGATAAATC GCTTGAAATG TTGCGACGCT TAGATCACAG GGGCGGGGTC	4140
	GGCGCAGATG GCATCACTGG TGATGGCGCA GGTATTATGA CTGAAATACC TTTTGCAATT	4200
20	TTCAAACAAC ATGTAACGGA CTTTGATATC CCAGGTGAAG GTGAATATGC CGTGGGGTTA	4260
	TTTTTTTCCA AAGAACGCAT TTTAGGTTCT GAACATGAAG TAGTTTTTAA AAAATATTTT	4320
	GAAGGCGAAG GGTATCAAT TCTTGGTTAT CGTAATGTAC CAGTTAATAA AGATGCCATT	4380
25	GCTAAACATG TAGCAGATAC GATGCCAGTC ATTCAACAAG TGTATTATTGA TATTAGGGAC	4440
	ATTGAAGATG TTGAAAAGCG TTTGTTTTTA GCGAGAAAAC AATTAGAGTT CTATTCGACT	4500
	CAGTGCGATT TAGAATTGTA TTTTACGAGC TTATCACGCA AAACAATTGT ATATAAAGGT	4560
30	TGGTTACGAT CAGACCAAAT TAAAAAATA TATACAGATT TATCGGATGA TTTATATCAA	4620
	TCAAAGCTAG GGTAGTGCA TTCGAGATTT AGTACGAATA CATTCCCGAG TTGAAAAGG	4680
	GCACATCCTA ACCGTATGTT AATGCATAAT GGTGAGATTA ACACGATTAA AGGTAATGTA	4740
35	AACTGGATGC GAGCACGCCA ACATAAATTA ATCGAAACAT TATTTGGCGA GGATCAACAT	4800
	AAAGTGTTC AAATTGTCGA TGAGGATGGT AGTGAATCTG CCATTGTAGA TAATGCGCTA	4860
	GAGTTCTTAT CGTTAGCCAT GGAGCCAGAA AAGGCAGCGA TGTTACTCAT ACCTGAACCT	4920
40	TGGTTATATA ATGAAGCGAA TGATGCAAAT GTACGTGCGT TTTATGAATT TTATAGTTAT	4980
	TTAATGGAAC CGTGGGATGG TCCTACAATG ATTTGTTCT GTAACGGTGA CAAACTTGGC	5040
45	GCGCTTACAG ATAGAAATGG ATTACGTCCA GGTGTTATA CGATTACTAA AGATAACTTT	5100
	ATTGTCTTTT CATCTGAAGT GGGTGTGTG GACGTACCTG AAAGTAATGT TGCTTTTTAA	5160
	GGTCAATTGA ATCCTGGAAA GTTATTGCTT GTTGATTTTA AACAGAATAA AGTCATTGAA	5220
50	AATAATGATT TAAAAGGTGC GATTGCTGGA GAATTACCAT ATAAAGCGTG GATTGATAAC	5280
	CATAAAGTTG ACTTTGATTT TGAAAATATA CAATATCAAG ATTCGCAATG GAAAGATGAG	5340
55		

	CAGGAACTTG TAGAAGGTAA GAAGGATCCT ATCGGTGCAA TGGGATATGA TGCGCCAATT	5460
5	GCAGTGTTGA ACGAGCGACC AGAATCACTA TTTAATTACT TTAAACAGCT GTTTGCACAA	5520
	GTTACGAATC CACCAATTGA TCGGTATCGT GAAAAAATCG TAACGAGTGA ACTTTCTTAT	5580
	TTAGGTGGCG AAGGTAACCT ACTAGCACCT GACGAAACGG TTTTAGATCG TATTCAATTG	5640
10	AAAAGGCCGG TATTGAATGA ATCACACTTA GCAGCGATTG ATCAGGAACA TTTTAAATTA	5700
	ACTTATTTAT CAACGGTATA TGAAGGGGAT TTGGAAGATG CGTTAGAAGC ATTAGGCCGA	5760
	GAAGCAGTGA ATGCTGTAAA GCAAGGCGCT CAAATTCTAG TGTTAGATGA TAGTGGATTA	5820
15	GTTGATAGCA ATGGCTTTGC AATGCCGATG TTAAGCGCAA TAAGTCATGT GCATCAATTA	5880
	CTTATTAAAG CAGATTTACG TATGTCTACA AGTTTAGTCG CTAAATCTGG TGAGACACGA	5940
	GAAGTGCATC ATGTTGCTTG TTTACTCGCA TATGGCGCGA ATGCAATTGT GCCATACCTA	6000
20	GCGCAACGTA CAGTTGAACA ACTGACATTG ACAGAAGGGT TACAAGGCAC CGTTGTCGAT	6060
	AATGTTAAGA CATATACGGA TGTATTGTCA GAAGGTGTCA TTAAAGTAAT GGCTAAGATG	6120
	GGAATTTTCA CAGTGCAAAG TTATCAAGGG GCACAAATAT TTGAAGCGAT TGGCTTGTCT	6180
25	CATGATGTGA TTGATCGTTA TTTACTGGG ACACAGTCTA AGTTATCTGG TATTTTCGATT	6240
	GATCAAATTG ATGCTGAAAA TAAAGCACGT CAACAAAGTG ATGATAATTA TCTTGCATCA	6300
	GGTAGTACAT TCCAATGGAG ACAACAAGGT CAACATCATG CTTTAAATCC GGAATCTATT	6360
30	TTCTTATTGC AGCACGCATG TAAAGAAAAT GACTATGCGC AATTAAAGC ATACTCTGAA	6420
	GCGGTGAACA AAAATAGAAC AGATCACATT AGACATTAC TTGAATTTAA AGCATGTACA	6480
35	CCGATTGACA TCGACCAAGT TGAACCGGTA AGTGACATTG TCAAACGCTT TAATACAGGG	6540
	GCGATGAGTT ATGGATCGAT TTCAGCGGAA GCACATGAAA CGTTAGCACA AGCCATGAAC	6600
	CAATTAGGTG GAAAGAGTAA TAGTGGTGAA GGTGGCGAAG ATGCAAAACG TTATGAAGTA	6660
40	CAAGTTGATG GAAGCAACAA AGTAAGTGCG ATTAACAAG TTGCTTCTGG GCGTTTTGGT	6720
	GTAAGTAGTG ATTATTTACA ACATGCCAAA GAAATTCAAA TTAAAGTTGC GCAAGGTGCA	6780
	AAGCCTGGTG AAGGTGGTCA ATTACCTGGT ACTAAGGTAT ATCCGTGGAT TGCGAAGACA	6840
45	AGAGGGTCAA CGCCAGGTAT CGGTCTGATT TCACCACCGC CACATCATGA TATTTATTCA	6900
	ATAGAAGATT TAGCGCAACT GATACATGAT TTGAAAAATG CGAATAAAGA TGCAGATATC	6960
	GCGGTAAAAA TAGTTTCGAA AACAGGTGTT GGTACCATTG CATCTGGGGT GGCAAAAGCA	7020
50	TTTGCAGATA AAATTGTCAT CAGTGGTTAC GATGGTGGTA CAGGGGCTTC ACCCAAAACG	7080
	AGTATTTCAGC ATGCCGGTGT TCCTTGGGAG ATTGGTTTAG CAGAAACACA TCAAACATTA	7140

55

EP 0 786 519 A2

	AAAGATGTAG CGTACGCATG TGCCTTGA GCGGAAGAAT TTGGATTTGC AACTGCACCA	7260
	TTAGTGGTGT TGGGCTGTAT TATGATGCGT GTATGCCATA AAGATACATG TCCAGTAGGA	7320
5	GTTGCAACTC AAAACAAAGA TTTACGTGCT TTATATAGAG GTAAAGCACA TCATGTTGTT	7380
	AATTTTATGC ATTTTATTGC ACAAGAATTA AGAGAAATTT TAGCATCTTT AGGTTTGAAA	7440
	CGTGTAGAAG ACTTAGTTGG AAGAACTGAT TTATTACAAC GATCATCAAC ATTAAGCG	7500
10	AATAGCAAAG CGGCTAGTAT TGATGTTGAA AACTGTTAT GTCCTTTCGA TGGGCCAAAC	7560
	ACAAAAGAAA TTCAACAAA TCATAATCTT GAGCATGGAT TTGATTAAAC AAATTTATAT	7620
	GAAGTAACGA AGCCATATAT TGCTGAAGGG CGTCGCTATA CAGGTAGCTT TACAGTAAAT	7680
15	AATGAACAAC GTGATGTAGG GGTATTACA GGTAGTGAGA TTTCGAAACA ATATGGAGAA	7740
	GCAGGACTTC CTGAAAATAC AATTAATGTT TATACGAATG GTCATGCTGG TCAAAGTCTT	7800
20	GCAGCATATG CACCGAAAGG CTTAATGATT CATCATACTG GAGATGCGAA TGACTATGTT	7860
	GGTAAAGGAT TATCTGGTGG TACGGTCATT GTCAAAGCAC CTTTGAAGA ACGACAAAAT	7920
	GAAATTATTG CTGGTAACGT CTCATTCTAT GGTGCGACAA GTGGTAAGGC ATTTATTAAC	7980
25	GGTAGTGACG GAGAAAGATT CTGTATTAGA AATAGTGGTG TAGATGTTGT CGTTGAAGGT	8040
	ATCGGCGACC ATGGATTAGA GTATATGACT GGTGGACATG TCATTAATTT AGGTGATGTA	8100
	GGTAAGAACT TCGGTCAAGG TATGAGTGGT GGTATTGCTT ACGTTATCCC GTCTGATGTA	8160
30	GAAGCTTTTG TTGAAAATAA TCAACTAGAT ACGCTTTCGT TTACAAAGAT TAAACACCAA	8220
	GAAGAAAAG CATTCAATTA GCAAATGCTG GAAGAACATG TGTCACACAC GAATAGTACG	8280
	AGAGCGATTG ATGTGTTAAA ACATTTTGAT CGCATTGAAG ATGTCGTCGT TAAAGTTATT	8340
35	CCTAAAGATT ATCAATTAAT GATGCAAAAA ATTCATTGTC ACAAATCATT ACATGACAAT	8400
	GAAGATGAAG CGATGTTAGC TGCAATTTTAC GATGACAGTA AAACAATCGA TGCTAAACAT	8460
	AAACCAGCCG TTGTGTATTA AGGAAAGGGG GAGATACGAT GGGTGAATTT AAAGGATTTA	8520
40	TGAAGTATGA CAAACAGTAC TTAGGTGAAT TATCACTGGT AGACCGTTTG AAGCATCATA	8580
	AAGCATATCA ACAACGATTT ACTAAAGAAG ATGCCTCTAT CCAAGGTGCA CGATGTATGG	8640
	ATTGTGGAAC GCCGTTTTGT CAAACCGGAC AACAGTATGG TAGGGAAACA ATAGGTTGTC	8700
45	CAATTGGAAG CTACATTCCT GAATGGAACG ACTTAGTGTA TCATCAAGAT TTAAAACTG	8760
	CTTATGAACG CTTAAGCGAA ACAAATAACT TTCCTGACTT TACAGGGCGT GTATGTCCTG	8820
50	CACCATGCGA AAGTGCTTGT GTGATGAAGA TTAATAGAGA ATCGATTGCG ATTAAGGTA	8880
	TTGAACGCAC AATTATTGAT GAAGCTTTTG AAAATGGTTG GGTAGCGCCG AAAGTTCCGA	8940

55

	CTGAAGAACT TAATCTACTA GGATATCAAG TAACTATTTA TGAACGTGCT AGAGAATCAG	9060
	GCGGTTTATT AATGTATGGT ATTCGGAATA TGAACTTGA TAAAGATGTG GTTCGACGTC	9120
5	GTATTAAGTT AATGGAAGAA GCGGCGATTA CTTTCATTAA TGGTGTGAA GTCGGTGTG	9180
	ATATTGATAA AGCAACGTTA GAATCTGAGT ATGATGCCAT TATATTATGT ACTGGTGAC	9240
	AAAAAGGTAG AGATTTACCT TTAGAAGGAC GCATGGGTGA TGGTATACAT TTCGCTATGG	9300
10	ATTATTTAAC TGAACAAACG CAGTTGTAA ATGGAGAAAT TGATGATATA ACAATAACTG	9360
	CAAAAGATAA GAATGTCATT ATCATTGGTG CTGGTGATAC AGGGGCAGAC TGTGTAGCGA	9420
	CAGCATTAA AGAAAATTGT AAATCGATTG TTCAATTTAA TAAATATACG AAATTGCCAG	9480
15	AAGCAATTAC ATTTACAGAA AATGCATCAT GGCCTTTAGC AATGCCGGTG TTTAAATGG	9540
	ACTATGCGCA CCAAGAGTAC GAAGCTAAGT TTGGTAAGGA ACCACGTGCA TATGGTGTTC	9600
20	AAACAATGCG TTACGATGTT GACGATAAAG GACACATACG TGGTTTGTAT ACTCAAATTT	9660
	TAGAGCAAGG CGAAAATGGT ATGGTCATGA AAGAAGGACC TGAAAGATTT TGGCCTGCTG	9720
	ACCTTGATTT ATTATCAATC GGCTTCGAAG GTACAGAACC AACAGTACCG AATGCTTTTA	9780
25	ACATTAATAA GGATAGAAAT CGAATCGTGG CGGATGATAC AACTATCAA ACTAATAATG	9840
	AAAAGGTATT TGCTGCTGGA GATGCTAGAC GTGGTCAAAG TTTAGTTGTA TGGGCAATTA	9900
	AAGAAGGTAG AGGCGTAGCG AAAGCAGTAG ATCAGTATTT AGCTAGTAAA GTTTGTGTAT	9960
30	AATCTTTGTA TGGAAATGGT GGTTACGTTG ACGTTGTGAC ATGCTGAATC GAGTTTGAAA	10020
	AAATCTAGTA TCTATCAACG TCACATGCCA TCTTTGTAAC CTAAAAACAA AGGTTTGTA	10080
	GACAACAAAT AGATTAATTA TAAGTAGTGA TTTTTTACAT TCGTTTATAG GTCAACTGTA	10140
35	GTGGAAGACA ATGATTTGTG GTAATCATGT AATGCTTAAA AACAAATATTG ACTTTTACAG	10200
	AACGTTTATA TATGATAAAT ATTGTGTTTA GGAGGAATAC CCAAGTCCGG CTGAAGGGAT	10260
	CGGTCTTGAA AACCAGACAGG GGCTTAACGG CTCGCGGGGG TTCGAATCCC TCTTCCTCCG	10320
40	CCATCAATAT TTATATTAAT TTCTATATAT AATGAAGGTA AGTGCTCAA TTTTGAGTAT	10380
	TTACCTTTTT TATTTGTCTT TGAATGGCTC GTAATTTTTG ATAATAGAAA TGATAAGGCA	10440
	TTGAGATTGG AAGGGCATTT GGCTTGTCGA ATATACATAG CTAAATGTCT TTTTGTGTTT	10500
45	GTGAAATATG ATGGATGGCT TGTGTGGACA AGTTTGCTAT TTATAGATAT GCATTTTCA	10560
	ATTTAGGAGT TGGCCATGCA TCTACACTTT ATAATGGTGA GAGCGTGGTG AGGTATTGTT	10620
50	AATAACGCAA TTGTAGCGAG GAGTTATTGC TACATATGTC GTTATGGCTC ATTGATTTTC	10680
	TGAAATGGCT ACCCCAGATA ATTGTGACAA AATAAAAATA TTTTGTGAA AGCCTTTACA	10740

55

EP 0 786 519 A2

	TAAAAAGAGA AGATGTAAAA GCCATCGTAA CCGCTATTGG GGGAAAAGAA AATCTTGAAG	10860
	CTGCAACGCA TTGTGTAACA CGATTACGTT TAGTGCTGAA GGATGAAAGT AAAGTTGATA	10920
5	AAGACGCATT AAGTAATAAC GCGTTGGTCA AGGGGCAGTT TAAAGCAGAC CATCAATATC	10980
	AAATTGTCAT TGGTCCAGGA ACAGTCGATG AAGTGTATAA GCAGTTTATT GATGAAACAG	11040
	GTGCTCAAGA AGCTTCGAAA GATGAAGCGA AACAAGCAGC TGCACAAAAA GGAATCCAG	11100
10	TACAACGTTT GATCAAATTG TtGGGGGATA TTTTATACC AATATTACCT GCGATTGTGA	11160
	CAGCTGGTTT GTTAATGGGA ATCAATAATT TACTTACAAT GAAAGGTTTA TTTGGTCCAA	11220
	AAGCACTTAT TGAGATGTAT CCACAAATTG CTGATATTTC AAACATCATT AATGTGATTG	11280
15	CGAGTACGGC ATTTATTTTC TTACCAGCAT TAATTGGTTG GAGTAGTATG CGTGTATTG	11340
	GTGGTAGTCC GATTCTAGGC ATAGTCTTAG GTTTGATTTT AATGCATCCG CAATTAGTAT	11400
	CTCAGTATGA TTTGGCAAAA GGAATATTTC CGACGTGGAA CTTATTTGGC TTAGAGATTA	11460
20	AGCAGTTGAA TTACCAAGGT CAAGTGTTGC CAGTtTTAAT TGCAGCTTAC GTTCTAGCTA	11520
	AAATTGAAAA AGGATTAAAT AAAGTCGTTT ACGATTCGAT AAAAATGTTG GTCGTTGGAC	11580
25	CCGTAGCGCT TTTAGTTACT GGATTTTATG CATTATTAT CATTGGACCA GTTGCGTTAT	11640
	TGaTTGGTAC AGGTATTACA TCTGGTGTTA CATTATATT CCAACATGCA GGATGGCTTG	11700
	GCGGAGCAAT ATATGGATTG TTATATGCAC CACTTGTAAT TACAGGACTA CACCATATGT	11760
30	TTTTAGCAGT AGATTTCCAA TTGATGGGTA GCAGCTTAGG CGGTACGTAT TTATGGCCAA	11820
	TTGTTGCGAT TTCCAATATT TGTCAGGGCT CTGCAGCATT TGGAGCATGG TTTGTCTATA	11880
	AACGTCGTAA AATGGTTAAA GAAGAAGGCT TGGCATTAA CACTTGTATT TCTGGTATGT	11940
35	TAGGTGTTAC TGAACCAGCC ATGTTCCGGT TGAACCTACC TCTGAAATAT CCATTTATCG	12000
	CTGCGATATC AACGTCTTGT GTATTGGGGG CAATCGTTGG TATGAATAAC GTACTTGGAA	12060
	AAGTTGGTGT TGGTGGCGTG CCAGCATTCA TTTCAATTCA AAAAGAATTT TGGCCAGTAT	12120
40	ATCTTATTGT GACAGCTATT GCTATTGTTG TACCATGTAT ACTAACAATT GTGATGTCTC	12180
	ATTTTAGTAA ACAAAAAGCG AAAGAAATTG TTGAAGATTA ATAAAATAAA AAAGGGGCGT	12240
	TCGTTATTGT GACGTCCTTT ATTACGTTAT AAGGTGGTAA TTGTGTGTCG AAAGAAATAG	12300
45	ATTGGAGAAA ATCCGTTGTA TATCAAATTT ATCCTAAGTC GTTTAATGAT ACGACGGGGA	12360
	ATGGTATAGG AGATATCAAT GGAATTATAG AAAAATTGGA TTATATCAAG TTATTGGGTG	12420
	TTGATTATAT TTGGTTAACA CCAGTGTATG AATCACCGAT GAATGATAAT GGCTATGATA	12480
50	TCAGCAATTA TTTAGAAATC aATGAAGACT TTGGAACGAT GGATGATTTT GaAAAGTTAA	12540

55

EP 0 786 519 A2

	CGACGGAGCA	TGaATGGTTT	AAAGAAGCCC	GTAAATCTAA	AGATAACCCy	TATAGAGATT	12660
	ATTACTTTTT	CAGATCATCT	GAAGACGGGC	CGCCAACAAA	TTGGCATTCT	AAATTCGGTG	12720
5	GTAATGCATG	GAAGTATGAT	TCTGAGACAG	ATGAATATTA	TTTACATTTA	TTTGATGTCA	12780
	GTCAAGCTGA	TTTAAATTGG	GATAATCCGG	AAGTACGTCA	ATCGTTATAT	CGCATAGTCA	12840
	ATCATTGGAT	AGACTTCGGC	GTTGATGGTT	TTCGATTGA	TGTCATTAAAC	TTAATTTCTA	12900
10	AAGGTGAATT	TAAGGACTCT	GACAAAATAG	GTAAAGAATT	TTATACGGAT	GGTCCTAGAG	12960
	TGCATGAGTT	TCTGCATGAA	TTAAATCGTC	AAACGTTTGG	TAACACTGAC	ATGATGACTA	13020
	TAGGAGAAAT	GTCTTCGACG	ACGATTGAAA	ATTGTATTAA	GTATACACAA	CCAGAACGCC	13080
15	AAGAATTGAA	TAGTGTTTTT	AATTTTCATC	ATCTAAAGGT	TGATTATGTT	GATGGTGAAA	13140
	AGTGGACAAA	TGCGAgcTTG	nATTTTCATA	AGTTAAAGGA	AATTCTGATG	CAATGGCAAC	13200
	GAGGTATTTA	TGACGGTGGC	GGATGGAACG	CGATTTTCTG	GTGTAATCAT	GATCAGCCAC	13260
20	GGGTAGTGTC	TAGATTGGT	GATGATACGT	CGGAAGAGAT	GAGGATACAA	AGTGCTAAAA	13320
	TGTTAGCTAT	CGCACTGCAT	ATGTTGCAAG	GGACGCCATA	TATTTACCAA	GGTGAAGAAA	13380
25	TTGGTATGAC	GGACCCACAT	TTTACATCAA	TAGCACAATA	TCGTGATGTT	GAATCGATTA	13440
	ATGCCTACCA	TCAGTTGTTA	AGTGAAGGGC	ATGCTGAAGC	GGATGTGTTA	GCGATTTTAG	13500
	GACAGAAGTC	ACGAGACAAT	TCGAGAACGC	CTATGCAATG	GAGTGATGAT	GTTAATGCTG	13560
30	GATTTACAGC	TGGTAAnCCT	TGGATTGATA	TTTCGGAAAA	TTATCATCAG	GTCAACGTTA	13620
	GACAAGCACT	TCAGAATAAA	GAGTCTATTT	TCTATACGTA	TCAAAAATTA	ATACAATTAA	13680
	GACATACGCA	TGATATTATT	ACGTATGGAG	ACATTGTGCC	ACGTTTTATG	GATCATGATC	13740
35	ATTTATTTGT	TTATGAACGT	CATTATAAGA	ATCAACAATG	GCTAGTAATT	GCGAATTTCT	13800
	CAGCATCGGC	TGTTGATTTG	CCAGAAGGAT	TGGCTAGAGA	AGGTTGTGTT	GTGATTCAAA	13860
	CAGGCACAGT	GGAAAATAAT	ACGATAAGCG	GGTTTGGTGC	AATTGTAATC	GAAACAAACG	13920
40	CGTAAATATA	ATTGAGTGGA	TGCGTTTATA	TGGCGAAACA	AAAAAAGTTT	ATGAAGATTT	13980
	ATGAGGCGTT	GAAAGAAGAT	ATATTAAACG	GGCAGATTCA	ATATGGTGAA	CAAATCCGT	14040
	CTGAACATGA	TTTGGTGCAA	TTGTACCACT	CATCTCGAGA	GACCGTGCGT	AAGGCATTAG	14100
45	ATTTGTTGGC	ATTAGACGGC	ATGATTCAAA	AGATTTCATGG	TAAAGGGTCA	CTTGTCAATT	14160
	ATCAGGAGGT	TACAGAGTTT	CCATTTTCTG	AAC TTGTTAG	TTTTAAAGAA	ATGCAAGAAG	14220
	AAATGGGCGT	CGCATATTTA	ACTGAAGTTG	TTGTGAATGA	GGTTGTTGAA	GCGCATGAAG	14280
50	TTCCAGAAGT	TCAACATGCT	TTAAACATCA	ATTCTAGTGA	ATCACTCATT	CATATTGTTA	14340

55

EP 0 786 519 A2

	TTGTTTCAGA TATAGGTAAT GATGTTGCGA GTGATTCTAT TTATGATTAT TTGGAAAAGG	14460
	TATTAAATCT TAATATTAGT TATTCAAGTA AGTCTATTAC TTTTGAACCG TTTGATGAAC	14520
5	AAGCATATCA ATTGTTTGGT GATGTATCGG TGGCTTATTC AGCAACAGTT CGAAGTATTG	14580
	TGTATTTAGA AAATACAATG CCGTTTCAAT ATAATATTTC AAAACATCTT GCAAATGAAT	14640
	TTAAATTTAA TGACTTCTCA AGACGTCGTA TAAAGTAAAC AATGATATAA ATGATTATA	14700
10	CTTGCAATTA ACTATTAAAA TATAGTAATA TATATCTTGC CGTGCTAGGT GGGGAGGTAG	14760
	CGGTCCCTG TACTCGAAAT CCGCTTTATG CGAGGCTTAA TTCCTTTGTT GAGGCCGTAT	14820
	TTTTGCGAAG TCTGCCCAA GCACGTAGTG TTTGAAGATT TCGGTCCTAT GCAATATGAA	14880
15	CCCATGAACC ATGTCAGGTC CTGACGGAAG CAGCATTAAAG TGGATCATCA TATGTCCGT	14940
	AGGGTAGCCG AGATTTAGCT AACGACTTTG GTTACGTTTC TGAATTACGT TCGATGCTTA	15000
	GGTGCACGGT TTTTATTTT TTAAATATTA AACCGATTAT TAAGAGTTGA AAATATATAA	15060
20	TTATAGAAGC TACTTTCTTG AAGACAATTC AGCGTATTAT ACGTGAACA TGTGTGGG	15120
	AAGTAGCTTT TTTATATGTG AAGTTGATT CAAGTGAACG CGATGTGCAG TTTGAATGAT	15180
25	TTTTGTGTCA ATGAAAAGTA AGAAGTTATA ATTTGATGAT AAAGAAATGA TGGTGAAATG	15240
	AGGGGGAGTA TCTTACAATA GAATTATTAA TGAGATACGT TATGATTATT GACAATCAAA	15300
	TGCCTACGGA GGACATATGC AAATATATTT AAGTACTTTA ACAGAGTTAG ATTATGATAA	15360
30	ATCTTTAAAT AGTATTGAAG AAAGTTTGA TGATAATCCT GAAACGAGTT GGCAAGCACG	15420
	TGCGAAAGTA AAACATTTAA GAAAATCTCC TTGCTATAAT TTTGAATTAG AAGTAATAGC	15480
	GAAAAATGAA AATAACGATG TCGTTGGACA CGTTTTATTA ATTGAAGTAG AAATTAATAG	15540
35	TGATGATAAG ACGTATTATG GTTTGGCGAT TGCCTCTTTA TCAGTTCATC CTGAATTACG	15600
	TGGA CA AAAAA TTAGGTCGTG GCTTGTTCA AGCAGTAGAA GAGCGTGCCA AAGCACAAGA	15660
	GTATAGTACG GTTGTGTAG ACCATTGTTT TGA CT ACTTT GAAAAGTTGG GTTATCAAAA	15720
40	TGCTGCTGAG CATGACATTA AATTAGAATC TGGTGATGCA CCGTTACTTG TAAAATATTT	15780
	ATGGGATAAT TTGACGGATG CACCACACGG AATCGTAAAA TTTCCAGAAC ATTTTTATTA	15840
	ATTGTTCAAT TAAGAAGTAA AGGTATTATC ATGCTATAAT GAGAGGTAAT TGT TT TATGGA	15900
45	GGTGCTAACT TGAATTATCA AGCCTTATAT CGTATGTACA GACCCCAAAG TTT CG AGGAT	15960
	GTCGTCGGAC AAGAACATGT CACGAAGACA TTGCGCAATG CGATTTCGAA AGAAAAACAG	16020
	TCGCATGCTT ATATTTTTAG TGGTCCGAGA GGTACGGGGA AAACGAGTAT TGCCAAAGTG	16080
50	TTTG C TAAAG CAATCAACTG TCTAAATAGC ACTGATGGAG AACCTTGTA TGAATGTCAT	16140

55

EP 0 786 519 A2

	AATAATGGCG	TTGATGAAAT	AAGAAATATT	AGAGACAAAG	TTAAATATGC	ACCAAGTGAA	16260
	TCGAAATATA	AAGTTTATAT	TATAGATGAG	GTGCACATGC	TAACAACAGG	TGCTTTTAAT	16320
5	GCCCTTTTAA	AGACGTTAGA	AGAACCCTCCA	GCACACGCTA	TTTTTATATT	GGCAACGACA	16380
	GAACCACATA	AAATCCCTCC	AACAATCATT	TCTAGGGCAC	AACGTTTTGA	TTTTAAAGCA	16440
	ATTAGCCTAG	ATCAAATTGT	TGAACGTTTA	AAATTTGTAG	CAGATGCACA	ACAAATTGAA	16500
10	TGTGAAGATG	AAGCCTTGGC	ATTTAtcgCT	AAAGCGTCTG	AAGGGGGTAT	GCGTGATGCA	16560
	TTAAGTATTA	TGGATCAGGC	TATTGCATTT	GGTGATGGTA	CGTTAACATT	GCAAGATGCG	16620
	TTGAATGTCA	CAGGTAGCGT	ACATGATGAA	GCGTTGGATC	ACTTGTTTGA	TGATATTGTA	16680
15	CAAGGTGACG	TACAAGCATC	TTTTAAAAAA	TACCATCAGT	TTATAACAGA	AGGTAAAGAA	16740
	GTGAATCGCC	TAATAAATGa	TATGATTTAT	TTTGTCaGAG	ATACGATTAT	GAATAAAACA	16800
20	TCTGAGAAAG	ATACTGAGTA	TCGAGCACTG	ATGAACCTAG	AATTAGATAT	GTTATATCAA	16860
	ATGATTGATC	TTATTAATGA	TACATTAGTG	TCGATTCTGT	TTAGTGTGAA	TCAAAACGTT	16920
	CATTTTGAAG	TGTTGTTAGT	AAAATTAGCT	GAGCAGATTA	AGGGTCAACC	ACAAGTGATT	16980
25	GCGAATGTAG	CTGAACCAGC	ACAAATTGCT	TCATCGCCAA	ACACAGATGT	ATTGTTGCAA	17040
	CGTATGGAAC	AGTTAGAGCA	AGAACTAAAA	ACACTAAAAG	CACAAGGAGT	GAGTGTGCT	17100
	CCTGTTCAAA	AATCTTCGAA	AAAGCCTGCG	AGAGGCATAC	AAAAATCTAA	AAATGCATTT	17160
30	TCAATGCAAC	AAATTGCAAA	AGTGCTAGAT	AAAGCGAATA	AGGCAGATAT	CAAATTGTTG	17220
	AAAGATCATT	GGCAAGAAGT	GATTGATCAT	GCCAAAAATA	ATGATAAAAA	ATCACTCGTT	17280
	AGTTTATGTC	AAAATTCGGA	ACCTGTGGCG	GCAAGTGAAG	ATCACGTACT	TGTGAAATTT	17340
35	GAGGAAGAGA	TCCATTGTGA	AATCGTCAAT	AAAGACGACG	AGAAACGTAG	TAGTATAGAA	17400
	AGTGTTGTAT	GTAATATCGT	TAATAAAAAAC	GTTAAAGTTG	TTGGTGTACC	ATCAGATCAA	17460
	TGGCAAAGAG	TTCGAACGGA	ATATTTACAA	AATCGTAAAA	ACGAAGGCGA	TGATATGCCA	17520
40	AAGCAACAAG	CACAACAAAC	AGATATTGCT	CAAAAAGCAA	AAGATCTTTT	CGGTGAAGAA	17580
	ACTGTACATG	TGATAGATGA	AGAGTGATAC	ATGACAAGCG	ATATAATCGT	ATGTATAATG	17640
	AAAGAAACAT	CATTTTATTG	ATAAATATTT	ATTGATTTTC	AAGGAGGAAA	TGGAATATGC	17700
45	GCGGTGGCGG	AAACATGCAA	CAAATGATGA	AACAAATGCA	AAAAATGCAA	AAGAAAATGG	17760
	CTCAAGAACA	AGAAAACTT	AAAGAAGAGC	GTATTGTAGG	AACAGCTGGC	GGTGGCATGG	17820
50	TTGCAGTTAC	TGTAACCTGGT	CATAAAGAAG	TTGTGACGT	TGAAATCAAA	GAAGAAGCTG	17880
	TAGACCCAGA	CGATATTGAA	ATGCTACAAG	ACTTAGTGTT	AGCAGCTACT	AATGAAGCGA	17940

55

EP 0 786 519 A2

TCCCTGGaAT GTGATCATAG ATGCATTATC CAGAACCTAT ATCAAACTT ATTGATAGCT 18060
 TTATGAAATT GCCAGGCATT GGTCCAAAGA CAGCCCAACG TCTGGCTTTT CATACCTTAG 18120
 5 ATATGAAAGA AGACGATGTT GTTCAGTTTG CCAAAGCATT AGTAGATGTT AAGAGAGAAT 18180
 TAACATATTG TAGCGTATGT GGTACATTA CTGAAAATGA TCCATGTTAT ATTTGTGAAG 18240
 ATAAGCAAAG AGATCGTTCA GTTATTTGTG TTGTGGAAGA TGACAAAGAT GTCATAGCTA 18300
 10 TGGAAAAAAT GAGAGAATAC AAAGGTTTAT ATCACGTTTT ACATGGGTCT ATTTGCGCTA 18360
 TGGATGGCAT TGGACCAGAA GATATTAATA TTCCTTCATT GATTGAACGC TTGAAAAACG 18420
 ATGAAGTTAG CGAATTAATC TTAGCTATGA ACCCGAACTT AGAGGGGGAA TCTACAGCCA 18480
 15 TGTATATTTT TAGATTAGTT AAGCCTATAG GTATCAAAGT GACGAGATTA GCACAAGGGT 18540
 TATCGGTAGG TGGCGATTTA GAGTATGCTG ACGAAGTAAC ATTATCTAAA GCAATCGCAG 18600
 GTAGAACAGA AATGTAATkT CTTCTATTAA ACATTTTTGA TTTTAATACT ATAGTAAGAA 18660
 20 AAGTCACAGT GTAATCATTG TGGCTTTTTT TATGGTGTGG TGTGATGTAC TACTTTATTT 18720
 GCGGTGTGGC GGTGGTATGG TTTACCTAGT TTTACTGAGG GATGGGTAAT CTTTAGGAAG 18780
 CAAGCCGTTG GTTGTGATTT GTTACTTCTA ATAGTAATGA TGTGAATTGG ATTATCGAAT 18840
 25 TAGATCTATG GTTATGGTGT GTTGGTGCTA TTAATTTGAT AAATGCGGTT AATGACTATG 18900
 CAAATGAAAT TCTTTTGTA TGAATGAT AGATGCTGGC TTAGTAAGTT GTACTTCTTT 18960
 GGTCTAAAGC TTATTAAATC AGCCTGTATA GCGGTGTTTT GAGAGATTAT TTAAAACTTG 19020
 30 TAAATTTATT TTAAATTTCT GGTAAAAAA TAACGTTCTG TTTTGCGTTT TTTTGTATG 19080
 ATATGGTTAG AGAAAAATCT GTTCTTGTT CTAAAAACG TACTATTTAT AAGTGGGGAT 19140
 35 TTTTAAAGTT CGATTTTATG GATAAGGGCG TTCAGTACAG ATGACAAAGG TGAATTTTT 19200
 ACTGTGTGTTA AGCAGTTTGA AAGCCTGTAT AGTATTTATT TGTGAGGCA AACAAAACAA 19260
 CTCAACTTAA GAAATAACTT GAATTACTAA CGAAAATTAA TTTTAAAAAG TTATTGACTT 19320
 40 AAATGTAAAT AAAATGTATA ATTAATTCTT GTCGGTAAGA AAAATGAACA TTGAAAACG 19380
 AATGACAATA TGTCAACGTT AATCCAAAA AACGTAATA TAAGTTACAA ACATTATTTA 19440
 GTATTTATGA GCTAATCAAA CATCATAATT TTTATGGAGA GTTTGATCCT GGCTCAGGAT 19500
 45 GAACGCTGGC GCGGTGCCTA ATACATGCAA GTCGAGCGAA CGGACGAGAA GCTTGCTTCT 19560
 CTGATGTTAG CGGCGGACGG GTGAGTAACA CGTGGATAAC CTACCTATAA GACTGGGATA 19620
 ACTTCGGGAA ACCGkAGCTA ATACCGGATA ATATTTTGAA CCGCATGGTT CAAAAGTGAA 19680
 50 AGACGGTCTT GCTGTCACTT ATAGATGGAT CCGCGCTGCA TTAGCTAGTT GGTAAGGTAA 19740

55

EP 0 786 519 A2

	GAGACACGGT CCAGACTCCT ACGGGAGGCA GCAGTAGGGA ATCTTCCGCA ATGGGCGAAA	19860
	gCtGaCGGAG CAACGCCGCG TGAGTGATGA AGGTCTTCGG ATCGTAAAC TCTGTTATTA	19920
5	GGGAAGAACA TATGTGTAAG TAACTGTGCA CATCTTGACG GTACCTAATC AGAAAGCCAC	19980
	GGCTAACTAC GTGCCAGCAG CCGCGGTAAT ACGTAGGTGG CAAGCGTTAT CCGGAATTAT	20040
	TGGGCGTAAA GCGCGCGTAG GCGGTTTTTT AAGTCTGATG TGAAAGCCCA CGGCTCAACC	20100
10	GTGGAGGGTC ATTGGAACT GGAAACTTG AGTGCAGAAG AGGAAAGTGG AATTCCATGT	20160
	GTAGCGGTGA AATGCGCAGA GATATGGAGG AACACCACTG GCGAAGGCGA CTTTCTGGTC	20220
	TGTAAGTGAC GCTGATGTGC GAAAGCGTGG GGATCAAACA GGATTAGATA CCCTGGTAGT	20280
15	CCACGCCGTA AACGATGAGT GCTAAGTGTT AGGGGGTTTC CGCCCTTAG TGCTGCAGCT	20340
	AACGCATTAA GCACTCCGCC TGGGGAGTAC GACCGCAAGT TGAAACTCAA AGGAATTGAC	20400
	GGGACCCGCG ACAAGCGGTG GAGCATGTGG TTTAATTCGA AGCAACGCGA AGAACCTTAC	20460
20	CAAATCTTGA CATCCTTTGA CAACTCTAGA GATAGAGCCT TCCCCTTCGG GGGACAAAGT	20520
	GACAGGTGGT GCATGGTTGT CGTCAGCTCG TGTCGTGAGA TGTGGGTGA AGTCCCGCAA	20580
25	CGAGCGCAAC CCTTAAGCTT AGTTGCCATC ATTAAGTTGG GCACTCTAAG TTGACTGCCG	20640
	GTGACAAACC GGAGGAAGGT GGGGATGACG TCAAATCATC ATGCCCTTA TGATTTGGGC	20700
	TACACACGTG CTACAATGGA CAATACAAAG GGCAGCGAAA CCGCGAGGTC AAGCAAATCC	20760
30	CATAAAGTTG TTCTCAGTTC GGATTGTAGT CTGCAACTCG ACTACATGAA GCTGGAATCG	20820
	CTAGTAATCG TAGATCAGCA TGCTACGGTG AATACGTTCC CGGGTCTTGT ACACACCGCC	20880
	CGTCACACCA CGAGAGTTTG TAACACCCGA AGCCGGTGGA GTAACCTTTT AGGAGCTAGC	20940
35	CGTCGAAGGT GGGACAAATG ATTGGGGTGA AGTCGTAACA AGGTAGCCGT ATCGGAAGGT	21000
	GCGGCTGGAT CACCTCCTTT CTAAGGATAT ATTGCGAACA TCTTCTTCAG AAGATGCGGA	21060
	ATAACGTGAC ATATTGTATT CAGTTTTGAA TGTTTATTTA ACATTCAAAT ATTTTTTGGT	21120
40	TAAAGTGATA TTGCTTATGA AAATAAAGCA GTATGCGAGC GCTTGAATAA AAAGAAATTG	21180
	TACATTGAAA ACTAGATAAG TAAGTAAAT ATAGATTTTA CCAAGCAAAA CCGAGTGAAT	21240
	AAAGAGTTTT AAATAAGCTT GAATTCATAA GAAATAATCG CTAGTGTTTCG AAAGAACACT	21300
45	CACAAGATTA ATAACGCGTT TAAATCTTTT TATAAAAGAA CGTAACTTCA TGTTAACGTT	21360
	TGACTTATAA AAATGGTGGA AACATAGATT AAGTTATTAA GGGCGCACGG TGGATGCCTT	21420
	GGCACTAGAA GCCGATGAAG GACGTTACTA ACGACGATAT GCTTTGGGGA GCTGTAAGTA	21480
50	AGCTTTGATC CAGAGATTTT CGAATGGGGA AACCCAGCAT GAGTTATGTC ATGTTATCGA	21540

55

EP 0 786 519 A2

	GAGGAAGAGA AAGAAAATTC GATTCCCTTA GTAGCGGCGA GCGAAACGGG AAGAGCCCAA	21660
	ACCAACAAGC TTGCTTGTTG GGGTTGTAGG ACACTCTATA CGGAGTTACA AAGGACGACA	21720
5	TTAGACGAAT CATCTGAAA GATGAATCAA AGAAGGTAAT AATCCTGTAG TCGAAAATGT	21780
	TGTCTCTCTT GAGTGGATCC TGAGTACGAC GGAGCACGTG AAATCCGTC GGAATCTGGG	21840
	AGGACCATCT CCTAAGGCTA AATACTCTCT AGTGACCGAT AGTGAACCAG TACCGTGAGG	21900
10	GAAAGGTGAA AAGCACCCCG GAAGGGGAGT GAAATAGAAC CTGAAACCGT GTGCTTACAA	21960
	GTAGTCAGAG CCCGTTAATG GGTGATGGCG TGCCTTTTGT AGAATGAACC GGCGAGTTAC	22020
	GATTTGATGC AAGGTTAAGC AGTAAATGTG GAGCCGTAGC GAAAGCGAGT CTGAATAGGG	22080
15	CGTTTAGTAT TTGGTCGTAG ACCCGAAACC AGGTGATCTA CCCTTGGTCA GGTGAAGTT	22140
	CAGGTAACAC TGAATGGAGG ACCGAACCGA CTTACGTTGA AAAGTGAGCG GATGAACTGA	22200
	GGGTAGCGGA GAAATCCAA TCGAACCTGG AGATAGCTGG TTCTCTCCGA AATAGCTTTA	22260
20	GGGCTAGCCT CAAGTGATGA TTATTGGAGG TAGAGCACTG TTTGGACGAG GGGCCCCCTCT	22320
	CGGGTTACCG AATTCAGACA AACTCCGAAT GCCAATTAAT TTAAGTTGGG AGTCAGAACA	22380
	TGGGTGATAA GGTCCGTGTT CGAAAGGGAA ACAGCCCAGA CCACCAGCTA AGGTCCCAA	22440
25	ATATATGTTA AGTGAAAAG GATGTGGCGT TGCCAGACA ACTAGGATGT TGGCTTAGAA	22500
	GCAGCCATCA TTAAAGAGT GCGTAATAGC TCACTAGTCG AGTGACACTG CGCCGAAAAT	22560
30	GTACCGGGGC TAAACATATT ACCGAAGCTG TGGATTGTCC TTTGGaCAAT GGTAGGAGAG	22620
	CGTTCTAAGG GCGTTGAAGC ATGATCGTAA GGACATGTGG AGCGCTTAGA AGTGAGAATG	22680
	CCGGTGTGAG TAGCGAAAGA CGGGTGAGAA TCCCGTCCAC CGATTGACTA AGGTTTCCAG	22740
35	AGGAAGGCTC GTCCGCTCTG GGTAGTCCG GTCCTAAGCT GAGGCCGACA GcGTAGGCGA	22800
	TGGATFAACAG GTTGATATTC CTGTACCACC TATAATCGTT TTAATCGATG GGGGACGCA	22860
	tAGGATAGGC GAAGcGTGcG ATTGGATTGC ACGTCTAAGC AGTAAGGCTG AGTATTAGGC	22920
40	AAATCCGGTA CTCGTTAAGG CTGAGCTGTG ATGGGGAGAA GACATTGTGT CTTCGAGTCG	22980
	TTGATTTTAC ACTGCCGAGA AAAGCCTCTA GATAGAAAAT AGGTGCCCCG ACCGCAAACC	23040
	GACACAGGTA GTCAAGATGA GAATTCTAAG GTGAGCGAGC GAACTCTCGT TAAGGAACTC	23100
45	GGCAAAATGA CCCCCTAACT TCGGGAGAAG GGGTGCTCTT TAGGGTTAAC GCCCAGAAGA	23160
	GCCGCAGTGA ATAGGCCCAA GCGACTGTTT ATCAAAAACA CAGGTCTCTG CTAAACCGTA	23220
	AGGTGATGTA TagGGcTGAC GCCTGCCCGG TGCTGGAAGG TTAAGAGGAG TGGTTAGcTT	23280
50	CTGCGAAGcT ACGAATCGAA GCCCCAGTAA ACGGCGGCCG TAACTATAAC GGTCTAAGG	23340

55

EP 0 786 519 A2

	TGTCTCAACG AGAGACTCGG TGAAATCATA GTACCTGTGA AGATGCAGGT TACCCGCGAC	23460
	AGGACGGAAA GACCCCGTGG AGCTTTACTG TAGCCTGATA TTGAAATTCG GCACAGCTTG	23520
5	TACAGGATAG GTAGGAGCCT TTGAAACGTG AGCGCTAGCT TACGTGGAGG CGCTGGTGGG	23580
	ATACTACCCT AGCTGTGTTG GCTTTCTAAC CCGCACCCT TATCGTGGTG GGAGACAGTG	23640
	TCAGGCGGGC AGTTTGACTG GGGCGGTGCG CTCTAAAAG GTAACGGAGG CGCTCAAAGG	23700
10	TTCCCTCAGA ATGGTTGGAA ATCATTCATA GAGTGTAAG GCATAAGGGA GCTTGAAGTG	23760
	GAGACCTACA AGTCGAGCAG GGTGAAAGA CGGACTTAGT GATCCGGTGG TTCCGCATGG	23820
	AAGGGCCATC GCTCAACGGA TAAAAGCTAC CCCGGGGATA ACAGGCTTAT CTCCCCAAG	23880
15	AGTTCACATC GACGGGGAGG TTTGGCACCT CGATGTCGGC TCATGCGATC CTGGGGCTGT	23940
	AGTCGGTCCC AAGGGTTGGg CTGTTGCCCC ATTAAAGCGG TACGCGAGCT GGGTTCAGAA	24000
	CGTCGTGAGA CAGTTCGGTC CCTATCCGTC GTGGGCGTAG GAAATTTGAG AGGAGCTGTC	24060
20	CTTAGTACGA GAGGACCGGG ATGGACATAC CTCTGGTGTA CCAGTTGTCTG TGCCAACGGC	24120
	ATAGCTGGGT AGCTATGTGT GGACGGGATA AGTGCTGAAA GCATCTAAGC ATGAAGCCCC	24180
	CCTCAAGATG AGATTTCCCA ACTTCGGTTA TAAGATCCCT CAAAGATGAT GAGGTTAATA	24240
25	GGTTCGAGGT GGAAGCATGG TGACATGTGG AGCTGACGAA TACTAATCGA TCGAAGACTT	24300
	AATCAAAATA AATGTTTTCG GAAGCAAAAT CACTTTTACT TACTATCTAG TTTTGAATGT	24360
30	ATAAATTACA TTCATATGTC TGGTGACTAT AGCAAGGAGG TCACACCTGT TCCCATGCCG	24420
	AACACAGAAG TTAAGTCCT TAGCGTCGAT GGTAGTCGAA CTTACGTTCC GCTAGAGTAG	24480
	AACGTTGCCA GGCAAAAAT GGATGCGATG AGCCGCATTG AGACCGCAAG GTCTCTTTTT	24540
35	TTTATGTCTA AAACGTCAAA ATAAAAAGCA AACACAAAGA AAAATGGCTT GGCGAAGTGA	24600
	AAACGTTTGA ATCTGACGAA ACGAGAAAAG AxCGCAACGA GTTTAGTAGA GCTAAATGAG	24660
	TAAGyGAGAG CCGAAGrAGA GGAAAGAAGC AAGCGATTGT CACAAGTCAA GAAAGGTTCT	24720
40	TAGCGAsGAT GGTAGCCAAC TTACGTTCCG CTAGAGTAGA ACTGGAAATG ATAATTTAAT	24780
	AATGTACACT TTCGATTGTC TAAGTATGTA CAACTTTAAT TTTGTGTTTA TATAAATTTA	24840
	AAATGATATC ATCGAAAACA AAATATTGTA TAAATAGAGA AGAGCAGTAA GACGGTATCT	24900
45	AATTGAAAAT GATCTTACTG CTCTTTTATA TACTTTATTG AAATACAAAA AGGAAATTAA	24960
	TTATTATACA ATAGACAAGC TATTGCATAA GTAACACTAA CTTTTATCAA AGAAGTGTTA	25020
	CTTTATAATT AATGATTTTA TTAGAGCGTC TACATGCGGT TTAAAGCAT CATCGTCTAT	25080
50	ACCGCCAAAG CCTAATATAA ATTTAGGGGT TTTCTTATAG TCTTGATCAT CATCAAAATT	25140

55

EP 0 786 519 A2

	TCCATTTT	ACTGTAATTG	TAAAATGCAT	ACCCGTTTCA	GCACCTTGAA	TATCAAGCTG	25260
	CTCTTTGTAA	GGTTTCAATC	TTTTTAAAT	ATAGGTTAGT	TTTCTACGAT	AAATTCGTCT	25320
5	CATTTTATTT	AAATGCCTTT	CAAAACCACC	GGAAGATATA	AACGTTGCAA	TAAGGTTTTG	25380
	CATATGAACA	GGTACAGTGT	TGCCTTCAAT	GTGATTTTGA	GAATGATATT	TTTTCATTAT	25440
	AGAATAGGGT	AACACCATAT	ATGCAACTCG	ACAGCTAGGA	AAAATAGACT	TTGAAAATGT	25500
10	ACTGATATAA	ATCACTTTTT	CTCCTCTTGA	ATATAGACCT	TGAATTGCTG	GAATGGGTTT	25560
	GCCGAAATAT	CTAAACTCGG	AATCATAATC	ATCTTCTATA	ATAAATCGTT	CTTCTTTTTT	25620
	TTGAGCCCAT	TGTATTAATT	GAGTTCGTTT	TTTTAAGTCC	ATCACATATC	CAGTTGGAAA	25680
15	TTGATGGGAA	GGCGTTATAT	ATACTATATT	TTTTTGTGAT	TTAATAACTT	CATCTACGTT	25740
	TATTCCATTA	TCTTCAACTT	CAATTGTGTC	ATATTCAACT	TGTTTTTTAT	CTAAAATATT	25800
	TTTGATTGGT	GGATAACTAG	GTTTTTCGAT	AATAAATGTT	GAAGTATAAA	GTAAATCGAC	25860
20	TAATTGATTT	ACTAATTGTT	CGGTAGATGA	GCCAATTATA	ATTTGATTAG	GATCACAAAT	25920
	TACGCCACGA	TTAGTAAATA	AATAAAATGC	CAGTTGAAAC	CGCAAATGTA	ATTCTCCTTG	25980
25	AAAATGTCCT	CTACGTAATT	GATTTAAATG	ATTTGTATCA	TAAAGATCTT	TGGAATACTT	26040
	TCTGAAAAGT	TCTATAGGGA	AATGTTTCGT	ATCTATTTCA	TCCAAATTAA	AAGCATAATC	26100
	ATAAGCTTCA	TCACTCGCTT	TTGGTTTATA	TGAATCATCA	TCAAAAAGAG	AGGGGATAGG	26160
30	TTGATTGTTT	AAAATTGTTA	AAGATTCAAT	TTCCGACACA	AAATATCCAG	AGCGAGGTCT	26220
	TGAATAAATG	TAACCTTCGT	CTAATAGAAG	TTGATATGCA	TGCTCTACGG	TTGTTTGGCT	26280
	AATAGATAAA	TGTTTGCTTA	ATTGTCTTTT	AGAATAAAAT	TTATCGCCTT	CTTTAAATTG	26340
35	ACCTTCAATT	ATTTGTTTTT	TTAATTTTTT	ATAAAGTTGA	TGGTATAAAG	TGTTTTTCAA	26400
	TTTTATAACT	GACCTCCTAA	ATTTATCTTA	TTTTGTACCT	TTTTAAATAT	CAGTTTATAC	26460
	ATTACAATGT	ATTTAATCAA	CTTGAAAAGG	GGTTTTATGT	ATAATGAGTA	AAATTATTGG	26520
40	ATCAGACAGA	GTCAAAAGAG	GTATGGCTGA	AATGCAAAAA	GGCGGCGTTA	TTATGGATGT	26580
	CGTTAATGCT	GAGCAAGCAA	GAATTGCAGA	AGAAGCTGGC	GCGGTAGCAG	TTATGGCATT	26640
	AGAACGAGTA	CCTTCTGATA	TTAGAGCTGC	TGGTGGTGTT	GCACGTATGG	CAAACCCTAA	26700
45	AATTGTAGAA	GAAGTAATGA	ATGCTGTTTT	TATTCCAGTC	ATGGCTAAAG	CACGTATTGG	26760
	TCATATCACT	GAAGCAAGAG	TATTAGAGGC	GATGGGTGTT	GACTATATTG	ATGAATCAGA	26820
	AGTGTTAACA	CCAGCAGATG	AGGAATATCA	CTTAAGAAAA	GATCAATTTA	CAGTACCATT	26880
50	TGTATGTGGA	TGTCGTAATT	TAGGTGAAGm	TGCGCGTAGA	ATTGGTGAAG	GTGCTGCTAT	26940

55

EP 0 786 519 A2

	ACAAGTTAAT TCAGAAGTTA GTCGATTGAC TGTAATGAAT GATGATGAGA TTATGACTTT	27060
	TGCGAAAGAT ATCGGTGCGC CTTATGAAAT TTTAAAACAA ATTAAAGACA ATGGTCGTTT	27120
5	ACCGGTAGTT AACTTTGCAG CTGGTGGCGT TGCGACTCCT CAAGATGCTG CTTTAATGAT	27180
	GGAATTAGGT GCTGACGGTG TATTCGTTGG ATCAGGTATT TTAAATCAG AAGATCCAGA	27240
10	AAAATTTGCT AAAGCAATTG TTCAAGCAAC AACACATTAC CAAGACTATG AACTAATTGG	27300
	AAGATTAGCA AGTGAACCTG GCACTGCTAT GAAAGGTTTA GATATCAATC AATTATCATT	27360
	AGAAGAACGT ATGCAAGAGC GTGGTTGGTA AGATATGAAA ATAGGTGTAT TAGCATTACA	27420
15	AGGTGCAGTA CGTGAACATA TTAGACATAT TGAATTAAGT GGTCAATGAAG GTATTGCAGT	27480
	TAAAAAAGTT GAACAATTAG AAGAAATCGA GGGCTTAATA TTACCTGGTG GCGAGTCTAC	27540
	AACGTTACGT CGATTAATGA ATTTATATGG ATTTAAAGAG GCTTTACAAA ATTCAACTTT	27600
20	ACCTATGTTT GGTACATGCG CAGGATTAAT AGTTCTAGCG CAAGATATAG TTGGTGAAGA	27660
	AGGATACCTT AACAAAGTTGA ATATTACTGT ACAACGAAAC TCATTCGGTA GACAAGTTGA	27720
	CAGCTTTGAA ACAGAATTAG ATATTAAAGG TATCGCTACA GATATTGAAG GTGTCTTTAT	27780
25	AAGAGCCCCA CATATTGAAA AAGTAGGTCA AGGCGTAGAT ATCCTATGTA AGGTTAATGA	27840
	GAAAATTGTA GCTGTTGAGC AAGGTAAATA TTTAGGCGTA TCATTCCATC CTGAATTAAC	27900
	AGATGACTAT AGAGTAACTG ATTACTTTAT TAATCATATT GTAAaAAAG CATAGCTTAA	27960
30	TGTATGCTAA ATCAACGAAT TATTGATATT TATAGATTG TTGAGAAGAA AATATCTCCT	28020
	TCAAACCTAG CTTTGGAGGA GTTATTTTTT ATGTCAAAT TAAAATGAT AAAAAATAAA	28080
35	GCTATACATA AGAAAAAAC CCTTCAAAGA GACTGAGAAT AGTCAAATTT TTGAAGGGGT	28140
	TAATTCGATG TTGATGTATT TGTAAATAA AGAATCCAGC GATTGCAGCT GAAATGAAAG	28200
	ATACTAGTGT tGCACCGAAT AATAATTTCA AACCAAAGCG GGCAACTGTA TCTCCTTTT	28260
40	TGTCATTAAAG TGATTTAATC GCACCTGAAA TAATACCGAT AGAGCTAAAG TTAGCAAATG	28320
	ATACTAAGAA TACAGATGTA ACACCTTTTG CGTGTTGAGA TAAATCACTA AGTTTACCAA	28380
	GTGCTTGCAAT TGCTACAAAT TCGTTAGATA ATAGTTTGT CGCCATAACT GAACCGGCTT	28440
45	GAACTGCATC TTGCCATGGC ACACCGACTA AGAATGCAAA TGGTGCAAAG ACAAACCAA	28500
	TTAATGTTTG GAAATCCCAA GAAATAGCGC CACCTGAAAC TGTACTAAAG ATATTGCTTA	28560
	CAATTCCATT TAATAGAGCG ATAATGGCAA TGTATCCGAT TAACATTGCG CCTACAATGA	28620
50	CAGCTACTTT AAATCCATCT AAAATATATT CTCCTAGCAT TTCGAAGAAT GATTGTTGTC	28680
55	TTTCTTCAGT TTCTTCAACT AATAATTTGT CATCTTCTTC ATTAACTTTA TAAGGGTTAA	28740

	TAGGTTCAAT TAAGGTAAAG TATGCACCGA TAATTGAAGC AGAAACAGTC GACATTGCTG	28860
	AAGCTGTTAA TGTGTATAAA CGTTGCTTAG GTATGTATGG TAATTGTTTT TTAATTGAAA	28920
5	TAAATACTTC AGATTGTCCC AAAATGCTG CAGCAACTGC ATTGTATGAT TCTAAACGTC	28980
	CCATACCATT AATTTTAGAA ATTAAGAATC CTAAAACATT AATGATTAAA GGTAAAATCT	29040
	TTGTGTATTG AAGGATACCG ATAATCGCTG AAATAAATAC GATAGGTAAT AATACACTGA	29100
10	AGAAGAATGG TGGTTGCTTA GGATCGATAT ATTGAATACC ACCGAATACA AAGTTAACAC	29160
	CATCTGCTGC TTTTAATAAT AAGTAGTTAA AACCGTTTGA AATACCACCA ATAACCTTGA	29220
15	TTCCCATTTG AGTTTAAAGC AAGATAAATG CAAAGATAAG CTGAATTGCA AGTAAAATTC	29280
	CTACATATTT CCAGCGAATA TTTTCTCTGT CTGAGCTAAA TAGAAACGCA AGTGCTAAAA	29340
	AGAAGATAAT TCCGATAATC CCAATTAGAA TATGCATATA TTTCTCATT CTTTAGTTTT	29400
20	TTCTACaATc TATCATACAA TAAAATGGAA GGGCTAACAT CATAAATTTT TGAAAATATA	29460
	AAAACAAATT AATTGAAAAA GGTCAAAATA GGTCAATATA TATAGTCAAA GAAGGTCAAA	29520
	AAGGGGTGAT ATACATGCAC AATATGTCTG ACATCATAGA ACAATAaTCA AACGTTTATT	29580
25	TGAAGAGTCG AATGAAGATG TCGTTGAAAT TCAGAGAGCG AATATCGCAC AGCGTTTTGA	29640
	TTGCGTACCA TCACAATTAA ATTATGTAAT CAAAACACGA TTCACTAATG AACATGGTTA	29700
	TGAAATCGAA AGTAAACGTG GTGGTGGTGG TTACATCCGA ATCACTAAAA TTGAAAATAA	29760
30	AGATGCAACA GGTATATTA ATCATTGCTT TCAGCTGATT GGACCTTCTA TTTCTCAACA	29820
	ACAAGCTTAT TATATTATTG ATGGGCTTTT AGATAAAATG TTAATAAATG AACGTGAAGC	29880
	TAAAATGATT CAAGCAGTTA TTGATAGAGA AACGCTATCA ATGGATATGG TTTCTAGAGA	29940
35	TATTATTAGA GCAAATATTT TAAAACGTTT GTTACCAGTT ATAAATTATT ACTAAATGAA	30000
	ATGAGGTGTT GAAGTGCTTT GTGAAAATTG TCAACTTAAT GAAGCGGAAT TAAAAGTTAA	30060
40	AGTTACAAGT AAAAATAAAA CAGAAGAAAA AATGGTGTGT CAAACTTGTG CTGAGGGGCA	30120
	CCATCCGTGG AATCAAGCTA ATGAACAACC TGAaTATCAA GAACATCAAG ATAATTTTCA	30180
	AGAAGCATTG GTTGTTAAGC AAATTTTACA ACATTTAGCT ACGAAACATG GAATTAATTT	30240
45	TCAAGA	30246

(2) INFORMATION FOR SEQ ID NO: 57:

(i) SEQUENCE CHARACTERISTICS:

- | | |
|----|------------------------------|
| 50 | (A) LENGTH: 14333 base pairs |
| | (B) TYPE: nucleic acid |
| | (C) STRANDEDNESS: double |
| | (D) TOPOLOGY: linear |

55

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 57:

	TATTCCTCCCA TCGGTTTATT AAATCGTCCA TTTCAATACT GTTTTCCCC AAGATGTCGA	60
5	TAAATCCATT TCAAACGCTT GGACGATATC TTGCATCGTA CATACATTAA TTTCATGTCC	120
	TTTAAATAAT GCTAACTTTT CAACTATGTC TGGGTACTTA CGATATAAAT CAACAACCTTG	180
10	CTCAAAATCT TTAGAGCCGC TTCGACTACT ACCAATCAAC GTTAATCCTT TTCAAGTAC	240
	TAATCGTGTA TCACTTCCA CGGGTAATTC ACTTACGCCT AACAAAGCAA TACTGCCTTC	300
	TGGTGAAATA TGTTCAACTA TTTGTTGAAG TGCAACTGA CTTCCTTTAC CTCCAACACA	360
15	TTCAAATGCA TGATCAATTT TAAGATCATC TGGTATTTGA TTTACTGTAA AGATGTCATC	420
	TACAAATGAA AAATGACTTA ATTTATAGTC TGTCTTACCA AATACATAAG TTTTAGCTTC	480
	TGGGTACAAC TTACGTAGCA AAATAGCAGT AATATAACCT AAGTTACCAT CACCCCAAAT	540
20	ACCAAAGCTG GTTTTCAAAG GTATAGATTT ACGTTCAAAT CGTTGTATAG CATGATAACT	600
	TACTGACACT AACTCTGTGT ATGAAATCGT ACTCAAATCA ATGTCATTAG GCAGCGGAAC	660
	GATACGATCA TGTGCCATCA CAACGTAGTC TTGCATAAAA CCATCATAAC CACTAGATCT	720
25	AAAATAACTA GAGGCTAAGT AATTCTCCGC AATAATATGA TGTGCTCTG TAGGTGTATT	780
	CGGTACCATT ACTACTTTTCG TACCTTTTTC AAATACCCCT TTACTATCAA ATACAACCTC	840
	ACCAACAGCT TCATGAACCTA ATGACATTGG TAATTTTTTG CGTAGTACAT TTTCATCTCT	900
30	TCGACCTGTG TAATACCTTT GATCAGCTGC ACAAATAGAC AAGTATAAAG GTCTTACGAT	960
	GACATGATTA CCATAAATAT CAACATTATT ATATGTGACG TCGAACTGTC TCGGTGCAAC	1020
35	GAGTTGATAT ACTTGATTAA TCATCGGCAA TATCACCTTG AATAATGGCA TTTGCTACTT	1080
	TTAAATCATA CGGTGTTGTC ACTTTAATGT TGTATAGTTC TCCaCGTACC AATTTAACTG	1140
	CATGTCCAGA TTCGACAATG ATTTTACATG CATCTGATAA GATTTCTTTT TGTTCACTAC	1200
40	TTAAGGCGCG ATAACCTATCT TGTAATAATT TAATATTAAA TGATTGTGGT GTTTGGCCTT	1260
	GATACATTTT ATTCCTTACA GGGATACTGT GTATGTTCTG TTTATCTTTA GACATTACAA	1320
	TCGTATCAAT TGCTTCAATG ACTGTATCTA CTGCACCATA TTTTGCTGCT ACTTCAATGT	1380
45	TCTCTTTAAT AATACGTTGA GTTAAAAATG GTCTTACGGC ATCATGAGTT ACAATCACAT	1440
	CATCATTATT AATTCCATTT ACATTGCGAA TATGGTCGAT AATGTTTATA ATTGTTTCAT	1500
	TTGATCCGT ACCACCTGCA ACTACTTTGA CACGTTGATC TGTAATGTTA TATTTTTTTA	1560
50	AAATATCCTG TGTATGGGAA ATCCACTGTG CTGGCGTTGC GATAATAATC TCATTAAATT	1620
	CACTCACTAA AATGAACCTC TCAATTGTAT GGATTAAAAT CGGTTTATTA TCAATATCTA	1680

55

	CTGCATAAAT CATGTTGTCC TCCATTCTGT CATTACATCA TTTCCATTTA TACATTACTG	1800
	ACCTATGCCC GCACATAAGC CTAACCTATT GCTCACTTGC CTCTTTTATT AATCCAAAGA	1860
5	TAGTTGTCAC AATAGTGTGA TAATTTTTTA TAAAAATGTA TTTTGTAAC TGACCATTCT	1920
	AAGTTGTTTT GCCATGCAGT TAATCATTA CTCTGACGAT ATTAAATTGT TAAAGGTATT	1980
10	AATGTTTACT CTTTTTCAAA TTCATTATTA CTGCCATCAT TTTACCATAT ATTATAATAA	2040
	ATTTATCTTA TTAAGTGGCT GTACTTGATT TTCACTTTAA AAATTATCAA ATATTGCCAT	2100
	CTCATTTTAA GTATACAAA TGCAAAACAA CCGATTCA CA AGCATATTTT ACACAAGTAA	2160
15	ACCGGCTATT TATCAACGTA TATTCGAAGA TGAATTATTT CGATAGTATC TATAGACCAG	2220
	ACGGCATTTC CACTTTCATA GCTATAACTA TACCAGCGTT TCGTCCTCA AAGGTGCATA	2280
	CTAATAAATC GTAAACATGA CTTTATCAAA TCGTCTTTC TTGTTAACTA ATTTATCAAA	2340
20	TGTCTCCGGG CCTTTTTCTA ACGGTAAAAA ATGAGAAATA ATAGGCTTTA CATTAAATATC	2400
	TTTCGTCTTC ATATAATGTA AGGTTGCCGT CCACTCTTTG CCCGAAAAT TACTGGACAA	2460
	ACAGTTCCAA GAGCCACATA CTGTCAACTC GTTACGCAGA ATTTTTTCAA AATGAACGCG	2520
25	ATCAATCTCA ATATCATCAT ATGGTATTCC GAGTAATACC ACCTCGCCAC CTTTTTTAGG	2580
	TAGCGTCAAT ATTTGACCAA TCGTAACTTT AGCACCTGAT GATTCTATAG CTAAATCGAT	2640
	TTGATTGGCG TAATGATTTT CGATGAATTT CTCAAGATTT TCTTCTTTTG AATTGATTGT	2700
30	TTGATGTGCG CCCAATGATG TTGCAATATC TAGTTTATGC GCATCTATAT CTATAGCGAT	2760
	GATATGTGCA GCACCAAATA TCGTGCCCA TTGAATAGCT AACAAACCTA TACTGCCACA	2820
35	CCCCATTACT GCAACAGTCA TACCAGGTTG TATATTCGAT TTATAAAACC CATGCGCAAC	2880
	AACGGCTGAT GGCTCAACCA TTGCTGCTTC AATGTAATCA ACATTGTCTG GAACCTTTAA	2940
	AACATTTTGC GCTGGCAATT TGACATATTC CGCGAACGAT CCAGGTTTCA ATGAGCCAAT	3000
40	GACGAATAAC TTTTCACATC GTGCATATTC ACCTTTTAAA CAATACTCGC ATTGATAACA	3060
	AGGTATTGCT GGGCAACCTG TCACTTTGTC GCCCACATTA ACATGCGTAA CATCACTTCC	3120
	AATGGCATCT ACTACACCTG AAAATTCTATG ACCAAATGGC ATACCTTTAA TGTATGGCCC	3180
45	CATTTTTTTG TATCGTGACG TGTCTGAACC ACATATGCCA GTCGCTCGTA CTTTAATAAT	3240
	AACGTCATTC GCACTTTCAA TGACTGGCTT TTCATTATCC TCATACCGTA AATCTTCCAC	3300
	GCCATATAAT TTCAATGCTT TCACTTGTA ATCACCTCAA ATTTGATTTA ATTCACAAC	3360
50	TTTTCTTTT TAAAAATACC TGTGCAAAA TAACCTGCAA TGACAATGGA ATTACTTACG	3420
	AGTAAATGTT CCATATAAAA ATCAGTGATT TGTCTTAATG GCCCAAGCAT AAAAGTTAGC	3480

55

EP 0 786 519 A2

	TGCTTTAATA CCTTCGCCGG ATTTTAAATG TTGATACGCC TCGTCCCATT TCGAAATATC	3600
	ATATATTTTT GTCAACAAAG CTTACAGCATT TACTAAACCA TCCGCCATAA GTTGCAATGA	3660
5	AGGTTCCCAA TCTGCTGGCT TTTGACTTCT ACTACCAACA ACTGTTATTT CTTTTTGAAT	3720
	CACTTTTTCC ATATCAAATG GAATTTACAGC ATCCTTAAAA ATACCTATTT GACTGTAGAA	3780
	ACCTTTTTTG CGTAAATAT CCAAACCTTG TCGTGCTGCT GGAACTGCAC CTGAACATTC	3840
10	AACAACAACA TCTGCACCGT AACCCTCTGT AATTCCATTG ATATACGTTT TTAAGTCTGT	3900
	TTGTTGTAAA TTGACTACAT AATCCATGTG CAATGCTTCT GCTTTATCTA ATCTGACTTT	3960
15	GTCATTGTCC AATCCAGTTA CCACAACAGT TCGCGCTTTA CTTTTTAAAC CTTGTGCTAC	4020
	AAGTAATCCG ATTGCCCCAG GTCCCATTAC AACTGCTACA TCGCCTGAAT TGAATTGAAT	4080
	CTTAGAAACG CCATGATGTG CACATGCTAA TGGTTCTGTC ATAGCTGCAG ACTGATACGA	4140
20	TATCGTCTG GAATATGATG CAAACTTTCT TCACGTGCAA TGACATAATT AGTAAATGCG	4200
	CCATCAACTT TGTTTCCAAT ACCTTTTCGA TGGTTGCATA AATTATAGTC TTTTGATTAA	4260
	CAGTATTCAC ACTCATTACA AACATAGAAT GTCGTTTCAG ATGtGACACG GTCACCAACT	4320
25	TTAAAATCTT TAACGTCTGC TCCAACTTCA ACGATTTAC CAGAAAATTC ATGACCTAAT	4380
	GTCACTGGAA AATTAACTTT ATAATGACCT TCATAAGTAT GAATATCTGT GCCACAAATT	4440
	CCTGCATAAT GTACTTTAAT CTTTACTTTA TCATCTAGCG GTGTTGCAAC TTCTTTATCA	4500
30	AGAAGTTCTA AGTTGCCATG TCCTTCTCTT GTTTTTACTA AAGCTTTCAC CACAAACACC	4560
	TCGATTTTTA ATTGAATAGA CTAAATAGTT TAAAGATAAG ATAGTTAACG ATATTACCAC	4620
	CTTGATCAAT ACTTGAAATT TCAGATGAAC CTTTTGGCAT TTGTACATTC GTACCTTTTCG	4680
35	CCATATCTGT GAAAATGGGT GCTACGTCTG TTGCAATATA TAGTGAAATT GCAATCATAA	4740
	TCGTACCCAC AATGACAGAA TGAATAATGT TTCCTCTTGC TGCACCAACA ATAAACGCGA	4800
40	CAACAAATGG TATCGTTGCT AAGTCACCAA AAGGTAGTAC TTGGTTTCCT GGTAAAATAA	4860
	CGGCTAATAA AACAGTGATA GGTACTAAAA TTAATGCTGT CGAAATAACT GCTGGATGAC	4920
	CTAATGCTAC AGCCGCATCC AATCCAATAT AAATTTACG TTCGCCAAAA CGTTTATTTA	4980
45	GCCATGTTCT TGCAGACTCT GAACTGGCA TTAAACCTTC CATTAAGATT TTTACCATTG	5040
	TAGGCATTAA TACCATTACT GCAGCCATTG ACATTCCTAA ATTAATGATG TCTCCAGGTT	5100
	TGTAACCTGC TAACACACCA ATACCTAAAC CTAAATTAA GCCGACAAAT ATAGACTCTC	5160
50	CAAATGCGCC AAAACGTTTT TGAATTGTTT CAGGATCAGC ATCTAACTTA TTCAGACCGG	5220
	GTACTTTTTG TAACAATTTA ACTAAGTAAA TACCTGGTGC ATAAGAAATT GTACTTCCTG	5280

55

EP 0 786 519 A2

CTACTTTCAA ACAGATAATT TGGAAAATAA CTGCTGCTAA TAACGCTTGC CAAATACTGC 5400
 CTGATACGGC ATAAACCATT GCTGCTGTAA ACGTATAATG CCAAAAATTC CAAATATCTA 5460
 5 CATTTCATCGT CTTTGTCACT TTAGTTACTA GCAATACAAC GTTAAGTATG ATTCCGAGTG 5520
 GAATAATAAA TGCTGCGACA GATGATGCCC AAGCGATAGA TGATGTTGCT GGCCAACCTA 5580
 10 CATCAATCAC ATTCAGACTG ACGCCTAAAT TTTTAACCAT CGCTTGTGCT GCTGGCCCTA 5640
 AATTTTAAAC TAATAAATCG ATGACTAAGA AAATCCCTAC AAAAGCCACA CCTATTGTTA 5700
 AACCAGACCT AAATGCCGCT CCAATTTTCT GCCTAAAGAA TAGGCCAAGC AAGAATATGA 5760
 15 CAACCGGTAA AATAACAGTt GCACCTAAAT CTAAAAATCC CCTTACAAA TCAGTGAAGT 5820
 AACTCATATT TAAACCCTCC CTGTTATATA TGCATTGTCA CGATACTTTC CGATTGTGAT 5880
 TACATTTGAC GTTACAGTCA TTTCAACGAC AACCCCTGCT AAATTCGACT GCAGTCCTTT 5940
 20 TGAATTACAG tCACTGCGTT TCTATGTCAT CAACAATCAT TTGTCGTGAT AGTCATTAT 6000
 ATGCAATTTG CATATATTAA TATGTTATCG ACCCACGTTA CATATCAATT CCGTTATTTT 6060
 TGTAAGTCTG TTAAGATTG TTGTTTGTG TCTTCAATAC CAATACCAGT TAAGAAATTA 6120
 25 CGTGCGTTGA TAACTGGGAA TTTATATTCT TTTTTGTGCA TTGCAGTTGT AACTAATAAA 6180
 TCTGCAGTGT CTTCATAAGG TCCAACCTCT GTAATTTTGA TTTGTTTAAT ATCTACTTTA 6240
 ATATTGTGTT CCTTTGCCAT TTCTCAATT GCATTATTTA CTACTGTGA CGTTGCAATA 6300
 30 CCTGCACCAC ACGCTACTAA TACTGTGTTT ATTTTCAATT CCTCCAATTA ATTTTGTAGT 6360
 ATATTCCAAA TAATCATTGA TTAGTGTGTC TAAAATTGTT TCATCTTTCTG TTCGTAGAAT 6420
 35 CTGCTCCAAT TTTTCTTCAC TTTGAAAAAT TTGCATCAAC TGTGTGAACA GCTTAAGTTG 6480
 ATCATCTACT TTATCCATTG CTAACATAAA AACGATTTTC ACTTCTGTCT GTTGATCAAG 6540
 TGTTCCATT TCAATAAAGC GCACTTCTTT TTCTAGAACA GCCACACCTA TCGTTCTATG 6600
 40 GTTAATATGT TCGACATCTG TATGCGGTAT AGCGACCGAA CATAGATGCG TTGGTAAACC 6660
 AGTAGCAAAT TCTTTTCTC TGTCGATGAC TGCATCTTTA AACGTTGACT TCACGAACCC 6720
 ATTTTGAAAT AACACATCTG ACATTTGTGA CAATACGGAT TCTTTATCAG TTGCCGACAA 6780
 45 ATTGAGCATT ATATTTTCTT TATGCACTAA TTGCTGTCCC ATCCATTTTC CCTCGCTTCT 6840
 TTATTTGAAT AATTTTAA AATCTCATTT ACATCAGAAT TTTTGCAGT TTGTATGATG 6900
 CGCTTAATTG CGTCATTGTC TTGCGCCACA TCTCTCAATT GTAGTAACGC TCTTAAGTGT 6960
 50 GTCATTTAT CAACAGCAGC AATAGGTACA ATAATATGGA TTGCTGTGCC ATCTGACATG 7020
 TATATTGGTT CTTGTAATAT CAACATACTC ATCGCTGTTT TATGTACATG CTTTTCAGAG 7080

55

	TGCATCTCAT GAATATATTT AATATCAATA AAATGATTAG CAACTAACAC ATCACTTGCT	7200
5	TTAGCAATAG CTTTCATCAAT ATTTTCAACA TGATGCATTC TTTTCACGTG CCTTGCCGGT	7260
	ATCAAGTCAG CTAAATCTAA TGyCTWATTT tGTGtGACaA TCGATCCATT AATGGTTGAA	7320
	ATTGAATTAT AATTGGCAAT AAAATCTTCT AAACCATCAC GTAGTcTGTA ATGTCATTAA	7380
10	CTGTCGTTGT GCGTTCAATT AATGCCATTA ACTTGTTTAT TTCCTTATCA ATGTCAGCCG	7440
	ATTCCTTATT AATGTACTTC ATCACTTCTT TACGTAACCT TCGTTGCTCA TTTTCAGATA	7500
	AAGCTACTTT TGTGATAAAT AATTTTTTAT GTGTTAGGAC AAACATTGGT GAAAAGACGA	7560
15	TGTCATAATC TAATGTGTAA TTTTCAAATG TTCTAAGTGA AATCGCATCT AAGAAAATAA	7620
	TTTCTGGAAA TAAGTTTCGC AACTCGTATA ACATCATTTG TGATACTGAC GTGCCTTGTC	7680
	TACACACGAT AATAGCTTTT ATCTTGCCAT CGAAGTTTTC ATCTTGACGT CTCAAACCTAC	7740
20	CTCCGAACAA CATGGTTAAA TATGCTATTT CATTATCAGG CAACGATTTT CCGAAATATT	7800
	CAGTTAACGA TTGACATGAT TGTTTCACCA TATGAAATAA GGATTGATAA TTTCTTGTA	7860
	AAGGATTTAT TAATTCATCA CGATCCGTTA AGTTATATTT AATCCTATAA AAAGCAGGCG	7920
25	TTAAATGTAA CAAGAGTTGC TGTGATAATT TCTCCTTATC TTCAATGTGA ATAAAAGTGA	7980
	TTTGTTCAAA ATGGTGAATC ATTTGAGCGA TGGCCATCGT TAAATTCGAT ATGCTATCTG	8040
30	ATTCTTGCAA ATCAGTCCAT TGCACACTTG TTGAAAGTAA GTGTAATGTC AAATATAACT	8100
	TTTCCGCTTC TGGCAAATCC GGCTCATGTT GCGTCATAAT CTCCGTTGCT TGATATTCTT	8160
	TCGTATCCCT CAAATACTGA TAATTAATAT TTAATGGATT CATCACATGA CCACTTTGAA	8220
35	TTCGTCTACG AATCACACAA AGGACATAAG GCAATGAACT AAGTGATTTG TCTATAAAGC	8280
	GACTCTTCAA AAATTGTTCT ACCTGTTTGA TCTTGCTTTT TTGATATGCG ATATCTTCGA	8340
	ATGTTAAGTT GAGCGCCTTT AAAACTTCAC TTTTAGTAAT ATCATGATTC AACCTTTGAT	8400
40	CAATCAACTT AATGAAGAAA CGGCGAACTT CAAATTCATC ACCAACAATT TCATAACCAT	8460
	GTTTTCGAGA ATACTTAAGT GACAAACCAT GATTTTCCAA TTGCTCTTTC ACATGATTTA	8520
	TATCGTGAAT GACAGTATTT TTAGTGACTT GTAAATCAAT TGAAAAATGG TTTAGAGACA	8580
45	TTGCGTTTTT CTTACTAAAA AGCATGAGCA TTAAATAATA ACGACGTGTT TCTATGCTAA	8640
	AAATGACATT GTTGCCGTTT AACATTTGCT GCTCCGATAC ATCTCGCTTG AATAACGTCA	8700
	TGATTTCAGA ACTTACAATA AAATTTCTT GGCTTGTTCT TTCAAGTTTT GGATAACCCT	8760
50	CTTGTTCAAG CCACAAATTG ATTTTTTGAA TGCGATATCC TAGTTGTCTA CGAGACAAAC	8820
	CAAATATCGA TTCAAGTTCT TTACCATGAA TAGTAGGATT CAATACAATT TCTCTGAGTA	8880

55

	TCAATCGTCA CACCGATGTA CACACTTTGA ACACATATTT TCAAAATGAG CATGTACATC	9000
	ATTGTGATGT TTTAACAACA TTTCAATTAT ATCTATATTT TTTGTGATTT TAATCTTTTA	9060
5	AAATAAAGCA ATTGAAATTT TTGCATATAT TTTTGTGTTT TGTGTTTTTT TGAAGCATTT	9120
	TTAACATACA TATCTCAATC ATTATCAAAT TGTCAAGACC ATTGTAACCC AATACAAAAA	9180
10	CCCTAAGGAC GCTTATATCA GCGCCTTAG GGTAACTGT ATCTATTTAA TTAAGTATTA	9240
	TTATTCGTAT GTACGTAAC TATGGTCTAT CAAGTTCCAC ACTTCTTCAA CATCAACTGC	9300
	TGTAGCAAAA TAAGCATTGG CAGGCTTACC TGTAACATGA TTAAATCGA CAGCCATAGT	9360
15	GCCATAAGTT AGTGGACTTT GATGTTCAAT GTCGATATTA ACGGGTACCA TTGTAAACAA	9420
	TTCTGGTTGT AACAAATACA AAATTGTACA AGCATCATGT ATTGGACCAC CATCCATATT	9480
	AAAGTGAGTC TTGTATGTCT TCTTAAAGAA TTGCAATAAT TCTACGACGA ACTGTGCAAC	9540
20	AGGATTATTG ATACTTTCAA AGCGTTCAAT CACGTGATCG TCGGCTAAAA CTTGATGTGT	9600
	TACATCTAAA CCAAACACAT TTATAGTAAT CCCACTTTCA AAAACACGCT TCGCTGCTTC	9660
	AGCATCTACC CAAATATTGA ATTCTGCTGT AGGCGTCCAA TTCCAAATG TACCACCACC	9720
25	CATCAAAGTA ATAGATTCAA TATGCTCAGC GATTCTTGGC TCACGAATCA ATGCCGTTGC	9780
	TACATTCGTA AGAGGACCTG TCGCTACAAT TGTTACAGGT GTATCACTCG TCATCACTTT	9840
	GTTTATAATC ACATCTGATG CTGGCATTGC AACTGCTTGA CGTGATGGTG TCGACGGTAG	9900
30	TTTCGGACCA TCTAATCCAG ATTCCCCATG TATTTCAGAA GCAAAGGCAG CTGGTTTAAAT	9960
	TAACGGCCTA TCCGCACCTT TCGCTACTGC TATATCTTGG CGTCCCATAA TATCCAATAC	10020
35	GTTCAAGGCG TTTGTCGTAT TCTTGTCAAC TGATTGATTA CCTGCGACTG TTGTTACAGC	10080
	TAATATCTCT AGTGGACTGT CAATTGCCCC CGCTAAAATT AATGCTATTG CATCATCGTG	10140
	TCCTGGATCA CAATCCATAA TAATCTTCT TTTCAATTTAT ATATCCACCT TTCTTAAGTT	10200
40	GTTATCGATA GCTTATGTAT ATTTATTTAT GTGGTGAATC ATGTTTATTT TGAAAAATAG	10260
	TTTAACTTT CTCATATTTT TGGATACAAA CACTATTTAT CTATTTTATG GCTTATAAAT	10320
	TTATCCGATA TGCCTTATCA ACCTACCTCG CTAAAAATAG GATGTCTACA TATCTATACC	10380
45	GACTTTTGTC AACTCATTTT CACAACAATA TAAACAGCAA TTTATATGAT TGTTACATGA	10440
	TTCAAACAAT TTTTATGAAA AATATTTTCA TACACAGAAT ATATATTGAT ATTAAATTTT	10500
	TCAAAAGCTA TATTGAGAAT AATTAGGAGG GATGTTGATG AAATCTTTAT TTGAAAAAGC	10560
50	ACAGCAGTTC GGCAAGTCCT TTATGTTACC TATCGCAATC TTACCAGCTG CAGGTCTATT	10620
	GTTGGGTATC GGTGGTGCAT TAAGTAATCC AAACACCGTT AAAGCATACC CTATTTTAGA	10680

55

EP 0 786 519 A2

AAATTTACCG GTCATCTTTG CAATTGGTGT CGCAATCGGA TTATCTAGAA GCGATAAAGG 10800
 TACTGCAGGT tTAGctGCGC TGCTCGGTTT CTTAATTATG AACGCAACTA TGAATGGCTT 10860
 5 ATTAACATATC ACGGGCACAT TGGCAAAAGA TCAGCTTGCA CAAAATGGAC AAGGCATGGT 10920
 GCTCGGTATA CAAACGGTTG AAACCGGTGT TTTTGGCGGG ATTATCACAG GTATTATGAC 10980
 CGCAATACTT CACAACAAAT ATCACAAGT GGTATTACCA CCGTATTTAG GTTTCTTTGG 11040
 10 TGGCTCTAGA TTTGTCCCTA TTGTCACAGC ATTTGCCGCA ATCTTTTTAG GTGTATTGAT 11100
 GTTTTTCATT TGGCCAAGCA TACAAGCCGG CATTATCAT GTTGGTGGAT TTGTAACGAA 11160
 AACAGGTGCC ATCGGTACTT TTGTTTATGG CTTCACTCTTA AGATTGTTAG GTCCACTCGG 11220
 15 TTTACACCAT ATTTTTTACT TACCGTTTGG GCAGACGGCA CTGGTGGTA CTTTAGAAGT 11280
 CAAAGGGCAC TTAGTTCAAG GTACGCAGAA CATCTTCTTT GCTCAACTTG GTGATCCAGA 11340
 TGTGACGAAG TATTATTCAG GTGTGTCAG CTTTATGTCA GGCCGTTTTA TTACGATGAT 11400
 20 GTTCGGCTTA TGTGGTGCCG CACTTGCAAT TTATCACACA GCTAAACCTG AACATAAAAA 11460
 AGTTGTCGGC GGTTTAATGT TATCCGCTGC ACTCACTTCA TTTTAAACAG GTATTACCGA 11520
 25 ACCTTTAGAG TTTAGTTTCT TGTTTGTGCG ACCTATTCTT TATGTAATCC ATGCCTTCTT 11580
 TGATGGATTA GCATTTATGA TGGCAGACAT TTTCAACATT ACAATTGGTC AAACCTTCAG 11640
 TGGAGGCTTT ATCGATTCT TACTCTTTGG TGTGCTACAA GGTAATAGTA AAACAAACTA 11700
 30 CCTATACGTC ATACCTATTG GAATTGTGTG GTTCTGTTTG TATTACATCG TTTTCAGATT 11760
 CTTAATTACG AAATTTAATT TCAAAACACC TGGTCGAGAA GATAAAGCTG CAGCACAACA 11820
 AGTTGAGGCT ACTGAAAGAG CACAACTAT TGTGCTGGT TTGGGAGGCA AAGATAACAT 11880
 35 TGAAATCGTT GACTGTTGTG CAACGAGACT ACGCGTCACA CTTCACTAAA ATGACAAAGT 11940
 CGATAAGTA TTA CTGAAA GTACTGGTGC CAAAGGTGTA ATCCAGCAAG GCACTGGTGT 12000
 GCAAGTAATT TATGGGCCTC ACGTTACAGT TATCAAAAAT GAAATTGAAG AATTGCTCGG 12060
 40 GGATTAAGAC TAACCGAAAT ATCAACAGAA CTAATGGCAA CGATGTACGA AGTAAGAAGT 12120
 GACATCGTTG CTTTTATTTT TAATGTTACA TTTGAAGCAT TAAGTTCATC ATGCACTGTA 12180
 GTGAGCCCGC AAATCGCCTC TGCTAGACAA TCATCTTAAT GCTATGATTA AAGCTTAAGT 12240
 45 GCCAGATTG AATTAAATTT CAACAACGAC TTTCACTACA TTAAAAATAG GGCCACTCGA 12300
 CACATATAGT TGTATCAAAT AGCCCTTTAT ACAATTTTTT GGGTAAGGTT TTACAATTTT 12360
 50 TGGGATGGTA TAGATTTTAT AAAAAGTTAT TTAAGTTCTT CTGCTTCAGC CATAATATCT 12420
 TTTAATGTTT TAGCTGAATG TGCGAACTTG CTTTGTCTT CGTCGTTTAA TGGGATTTCT 12480

55

TCCTCATATT CGCCTTCTAA TAATGCTGAT ACAGTCAATA CGGCATCTTC ATTTCTGAAA 12600
 ATCGCTTCAG TAATTCTAGC TAATCCCATT GCAACACCAT AATAAGTGGC ACCTTTAGCT 12660
 5 TGAATAATGT CATATGCTGC ATCACGTGTT TGAACAAAAA TTTGTTCAAT TTGCGCTTTG 12720
 CCTCAGGAC GTTGTTC AAG TAATGTCTTC AAAGGTTGAC CCGCAATATT AGCGTGTGAC 12780
 10 CATACTGGTA ATTCAGTGTC ACCATGTTCA CCAATAATTT GAGCATCGAC GCTACGTGGC 12840
 GCAACATCGn AcgyTcGCTT AACAATAATC TAAAGCGTGC AGAGTCTAAA ATTGTACCAG 12900
 AACCTATAAC ACGTTCCTTA GGTAAACCAG AGAATTTCCA TGTTCATAC GCTAAAATAT 12960
 15 CAACAGGATT TGTAGCTACC AAGAAAATAC CATCAAATTT TGATGCCATT ACTTCACCAA 13020
 CAATTGATTT GAATATTTTC AAGTTTTTAG ATACTAAATC TAAACGTGTT TCTCCAGGTT 13080
 TTTGTGCAGC ACCAGCACAG ATGACAACTA GATCCGCATC ATGACAATCA CTGTATTCGC 13140
 20 CAGCTTTTAC ACGAAGTGT GTTGAGAAT ATGGTGTGGC ATGTTTTTAA TCCATAACAT 13200
 CTCCTCGAAC TTTTTCAGTG TCTAAATCAA TGATGACTAA TTCATCAACA ATGCTTTGGT 13260
 TCACTAATGA AAATGCGTAG CTTGAACCTA CTGCACCATT ACCTATTAAT ACAACTTTGT 13320
 25 TCCCTTTTAA TTTGTTTATT AAAAAAATC CTTATGATT AATTCATAA CATACATGTA 13380
 GCTTCAAATA TGTTAGTTTA ATGCTGCTTA TTGACGATAC AAAAGCAAAT AAACATCTCT 13440
 TTTATTTTCA ACGCATAACT TAAAAGGTCA TGTGTCATCC GCTTTTAAAGT TTGTGATTTA 13500
 30 TTTACATAT AAAATGTAAC ATGCATTAAG TACTGGGTCA ATATTAAATT GTGATTTATT 13560
 TCACATTTTA TTTTAATTTT TACACCTTTT TAATTTGTAT mCGATTACAT CTTAGATGTC 13620
 35 TTTAGTCTTC GTACTTCGCC AGTGATTATT TACACTTTCA CATTTTATT ATCATGTTTA 13680
 CTTTTTTCTA GGAAAACAAC AATGTTTTTT GAATTAGTCA AATAAATGCG CTCAATCGTC 13740
 GGTGTCAGAA CAGACAATTG TACACAATGC TTATTGATAA GTATTTAAAA AATTAAAAAT 13800
 40 GTCATACAAT TATCAAATTT GCCATTTTAT TTATATTTTC TCAAACCAAT TAATTGAATA 13860
 TCGAAATTTT TAGTAGAATA ATCAAATAT ACAGATTAAA GGAGGAGTAT CATGCTTACA 13920
 GAACAAGAGA AAGACATTAT CAAACAAACG GTGCCTTTAC TTAAAGAGAA AGGGACAGAA 13980
 45 ATTACGTCAA TCTTTTATCC AAAAATGTTT AAAGCGCATC CTGAACTTTT AAACATGTTT 14040
 AATCAAACGA ACCAAAAACG AGGCATGCAA TCTTCAGCAT TAGCACAAGC TGTAATGGCC 14100
 GCAGCGGTTA ATATCGATAA CTTAAGTGTT ATTAAACCAG TCATTATGCC AGTCGCATAT 14160
 50 AAACACTGCG CACTACAAGT TTATGCTGAA CATTATCCAA TTGTGGGGAA AAATTTATTA 14220
 AAAGCCATTC AAGACGTGAC AGGATTAGAA GAAAATGACC CTGTCATTCA AGCTTGGGCA 14280
 55

(2) INFORMATION FOR SEQ ID NO: 58:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 8779 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 58:

```

GGTATTTTnG GAnGGGTACC TAAAGCAATT CCGGCAAAGG GTnAATCCAG GTACCGAAAT      60
GGACTTCCCG TTATCGATAA TACCGACATA TATTGTGACA AGTAGATTTT ATGGACATTT      120
AGGCTTACTT TTA CTGTGA TAATTGCATG TATGTTTACT GGTATTTAtC CaTCaATACA      180
TATCATTCAA TTATTGATAT ATGTACCGTT TTGTTTTTTC TTA ACTGCCt CCGTGACGTT      240
ATTAACATCA ACACTCGGTG TGTTAGTTAG AGATACACAA ATGTTAATGC AAGCAATATT      300
AAGAATATTA TTTACTTTT CACCAATTTT GTGGCTACCA AAGAACCATG GTATCAGTGG      360
TTTAATTCAT GAAATGATGA AATATAATCC AGTTTACTTT ATTGCTGAAT CATACCGTGC      420
AGCAATTTTA TATCACGAAT GGTATTTTCA TGGATCATTGG AAATTAATGT TATACAATTT      480
CGGTATTGTT GCCATTTTCT TTGCAATTGG TCGTACTTA CACATGAAAT ATAGAGATCA      540
ATTTGCAGAC TTCTTGTAAT ATATTTATAT GACGAAACCC CGCTAACCAT TAATAAATGG      600
AAGTGGGGTT CATTTTTGTT TATAATTTAA GTAAATAACA TATTAAGTTG GTGTATTATG      660
AACGTTTTTA TAAAGAAATT TTATCATTG GTAGTTCGAA TACTTTCTAA AATGATTACG      720
CCTCAAGTGA TTGATAAACC GCATATCGTA TTTATGATGA CTTTCCAGA AGATATTAAG      780
CCTATCATCA AAGCATTAAA TAATTCGTCG TATCAGAAAA CTGTTTTAAC AACACCAAAA      840
CAAGCGCCTT ATTTATCTGA ACTTAGCGAC GATGTTGATG TGATAGAAAT GACTAATCGA      900
ACATTGGTAA AACAAATTAA GGCTTTGAAA AGCGCGCAGA TGATTATTAT CGATAATTAT      960
TACCTATTGC TAGGTGATA TAATAAGACT TCTAATCAAC ACATTGTTCA AACGTGGCAT      1020
GCAAGTGGTG CATTAAAAAA CTTTGGCTTA ACAGATCATC AAGTCGATGT GTCTGACAAG      1080
GCAATGGTTC AGCAGTACCG TAAAGTTTAT CAAGCGACGG ATTTTACTT AGTGGGTTGT      1140
GAACAAATGT CACAATGTTT TAAACAGTCT TTAGGTGCAA CAGAAGAGCA AATGCTGTAT      1200
TTTGGGCTTC CGAGAATTAA TAAATATTAC ACAGCTGATA GAGCAACGGT TAAGGCAGAG      1260
TTAAAGGATA AATATGGAAT TACAAATAAG TTGGTATTAT ATGTACCAAC ATATAGAGAA      1320
GATAAAGCAG ATAATAGGGC TATTGATAAA GCTTATTTTG AAAAATGTTT ACCAGGATAT      1380

```

EP 0 786 519 A2

	ATCGACACGT CTACATTAAT GCTAATGTCA GATATAATTA TTAGCGACTA TAGTTCGCTG	1500
	CCAATAGAAG CTAGCTTGTT AGATATTCCA ACTATATTTT ATGTGTATGA TGAAGGAACA	1560
5	TATGATCAGG TGAGAGGCCT GAATCAATTT TACAAAGCAA TACCGGATAG CTACAAAGTG	1620
	TATACTGAAG AAGATTTAAT AATGACGATA CAAGAAAAAG AACATCTATT AAGTCCGTTA	1680
	TTTAAAGATT GGCATAAGTA TAATACTGAT AAAAGTTTAC ATCAGCTCAC AGAATATATA	1740
10	GATAAGATGG TGACAAAATG AGGTTTACGA TAATCATACC TACATGTAAT AATGAGGCAA	1800
	CAATTCGACA ATTGTTAATA TCTATTGAGA GTAAAGAACA CTATAGAATC CTTTGTATTG	1860
	ATGGTGGTTC TACTGATCAA ACAATTCCTA TGATTGAACG GTTACAAAGA GAACTCAAGC	1920
15	ATATTTTCATT AATACAATTA CAAAATGCTT CGATAGCTAC GTGTATTAAT AAAGGTTTGA	1980
	TGGATATCAA AATGACAGAT CCACATGATA GTGACGCATT TATGGTCATA AAACCAACAT	2040
20	CAATCGTATT GCCAGGTAAG TTAGATAGGT TAACTGCTGC TTTCAAAAAT AATGATAATA	2100
	TTGATATGGT AATAGGGCAG CGAGCTTACA ATTACCATGG TGAATGGAAA TTGAAAAGTG	2160
	CTGATGAGTT TATTAAAGAC AATCGAATCG TTACATTAAC GGAACAACCA GATTTGTTAT	2220
25	CAATGATGTC TTTTGACGGA AAGTTATTCA GTGCTAAATT TGCTGAATTA CAGTGTGaCG	2280
	AAACTTTAGC TAACAaCATAC AATCACGCAA TACTTGTCaA GCGGATGCAA AAAGCTACGG	2340
	ATATACATTT AGTTTCACAG ATGATTGTCG GAGATAACGA TATAGATACA CATGCTACAA	2400
30	GTAACGATGA AGATTTTAAT AGATATATCA CAGAAATTAT GAAAATAAGA CAACGAGTCA	2460
	TGGAAATGTT ACTATTACCT GAACAAAGGC TATTATATAG TGATATGGTT GATCGTATTT	2520
	TATTCAATAA TTCATTAAAA TATTATATGA ACGAACACCC AGCAGTAACG CACACGACAA	2580
35	TTCAACTCGT AAAAGACTAT ATTATGTCTA TGCAGCATTG TGATTATGTA TCGCAAAACA	2640
	TGTTTGACAT TATAAATACA GTTGAATTTA TTGGTGAGAA TTGGGATAGA GAAATATACG	2700
40	AATTGTGGCG ACAAACATTA ATTCAAGTGG GCATTAATAG GCCGACTTAT AAAAAATTCT	2760
	TGATACAAC TAAAGGGAGA AAGTTTGAC ATCGAACAAA ATCAATGTTA AAACGATAAC	2820
	GTGTACATTG ATGACCATAA ACTGCAATCC TATGATGTGA CAATATGAGG AGGATAAATT	2880
45	AATGAAACGT GTAATAACAT ATGGCACATA TGACTTACTT CACTATGGTC ATATCGAATT	2940
	GCTTCGTCGT GCAAGAGAGA TGGGCGATTA TTTAATAGTA GCATTATCAA CAGATGAATT	3000
	TAATCAAATT AAACATAAAA AATCTTATTA TGATTATGAA CAACGAAAAA TGATGCTTGa	3060
50	ATCAATACGC TATGTCGATT TAGTCATTCC AGAAAAGGGC TGGGGACAAA AAGAAGACGA	3120
	TGTCGAAAAA TTTGATGTAG ATGTTTTTGT TATGGGACAT GACTGGGAAG GTGAATTCGA	3180

55

EP 0 786 519 A2

	TAAAATCAAA CAAGAATTAT ATGGTAAAGA TGCTAAATAA ATTATATAGA ACTATCGATA	3300
	CTAAACGATA AATTAACCTA GGTTATTATA AAATAAATAT AAAACGGACA AGTTTCGCAG	3360
5	CTTTATAATG TGCAACTTGT CCGTTTTTAG TATGTTTTAT TTTCTTTTTC TAAATAAACG	3420
	ATTGATTATC ATATGAACAA TAAGTGCTAA TCCAGCGACA AGGCATGTAC CACCAATGAT	3480
	AGTGAATAAT GGATGTTCTT CCCACATACT TTTAGCAACA GTATTTGCCT TTTGAATAAT	3540
10	TGGCTGATGA ACTTCTACAG TTGGAGGTCC ATAATCTTTA TTAATAAATT CTCTTGGATA	3600
	GTCCGCGTGT ACITTTACCAT CTTGACTAC AAGTTTATAA TCTTTTTTAC TAAAATCACT	3660
	TGGTAAACA TCGTAAAGAT CATTTTCAAC ATAATATTTT TTACCATTTA TCCTTTGCTC	3720
15	ACCTTTAGAC AATATTTTTA CATATTTATA CTGATCAAAT GAGCGTTCCA TTAATGCATT	3780
	CCCCATCATA TTACGTTGCT TCTCGCCACC AAGGTTTTTA TAGTCTCCTG CACCCATGAT	3840
20	AACCTGATTA ATTCTAAATT TACCTCGTTT GGTAAGTATC GTATGGTTGT AATTTGCTGT	3900
	ATCACTTGAT CCAGTTTTTA AACCATCTGT ACCCGGCAAA CTCATTTTGT CACCTTCCAA	3960
	TGAAAAGTTG AATGTGTAAT ACGTAACTGC ATGCGTTGTT GGTGCTAACT GCTTTGTAAA	4020
25	GTCTAATATT TTAGGTGTCT CTTTAATCAC GTGTAAATCT AAAATGGCAT AGTCTCTAGC	4080
	AGTCGTTACA GTACGTTCTT GGTCTTTATA CTTTGTGGT GCAAATGTAC GTAATCTTGA	4140
	ATTTTCAGCA CCCGTTGGAT TGACGAAATG TGTATTTTTT ATTCCGATAG CTTTAGCTTT	4200
30	GTTATTCATT AAATCAACGA AATCGCTGGT GTTTTTTGAA ACCTTCTTAG CTAAAATTAA	4260
	TGCCGCGGCA TTAGTAGAAT TAGATACTGT AATTTGTAAT AGGTCTGCGA TTGTCCATAC	4320
	TTGTCCAGGA TATAGTTTCG TATTACTCAA CTCAGGTAGT GTAGACATAA TATATTCTTT	4380
35	GTTTCGTCATT GTGACTGTGT CATCAAGTGA AAGCTGCCCC TTATTTACAG CTTCCAATGT	4440
	TAAGTACATT GTCATTAATT TAGTCATAGA CGCTGGATTC CACTTAGTAT CGATATTGTA	4500
	TTGATACAGT AATTGTCCAG TTTGACTTAC ATTAACAGCA CTCGTCGGTT CGTATGCAGC	4560
40	CGACAAACCT GCATAACCAT ATTGATTTGC TGCTTGTACA GGGGTTACGT CACTGTTAGT	4620
	AGCTTGTGCA TATGGTGTCA TAATACTTAA TGTTAAACAT AAAATGATGA TAATAGATAT	4680
45	TAAATTTTTT ATAAAGCGTT AATCTTCCCT TTTCCAATTC TTAATATTC CCTAAAAGCA	4740
	ATGGTTATTC CTACTTACGG AAATCATTGC TAATTCATT CACCTTAATT AAATTGTTGA	4800
	AAATAAGTT TTCTGCAGTT AATTGAAAA ATAATGCAAA TATATTACGT GTGTAGCTAA	4860
50	AGGTGTTATA ATGTTTGTAC GAAGAGCAAA CTTACTCAA AGCGATTAA TTTTCATGTTT	4920
	TAATATAAAG ACTTTGAGAA GTTATTACAA AAAATGCAAT AGAAATATTC TATCATATAA	4980

55

EP 0 786 519 A2

	AAGTATATGA TAGAAATGCA TGTATCTATC TAAATGAATT AACTATAAAT TTCAAACAGA	5100
	AGAGGTAAAA CTATGAAACG AGAAAATCCA TTGTTTTTCT TATTTAAAAA ACTATCATGG	5160
5	CCAGTGGGTC TTATCGTTGC AGCTATCACT ATTCATCAC TAGGGAGCTT AAGTGGACTA	5220
	TTAGTGCCAC TGTTTACTGG ACGAATTGTA GATAAATTTT CCgTGAGCCA TATCAATTGG	5280
	AATCtAATCG CATTATTTGG TGGTATCTTT GTCATCAATG CTTTATTAAG CGGATTAGGT	5340
10	TTATATTTAT TAAGTAAAAT TGGTGAAAAG ATTATTTATG CGATACGCTC AGTTTTATGG	5400
	GAGCATATCA TACAATTAAA AATGCCATTG TTTGACAAAA ATGAAAGTGG TCAATTAATG	5460
	AGTCGATTAA CTGACGATAC GAAAGTGATA AATGAATTTA TTTCACAAAA GCTACCTmAC	5520
15	TTATTACCAT CAATCGTTAC ATtAGTTGGG TCACTAATCA TGTTATTTAT TTTAGATTGG	5580
	AAAATGACAT TATTAACATT TATAACGATA CCGATATTCG TTTTaATTAT GATTCCTCTA	5640
20	GGTCGTATTA TGCAAAAGAT ATCGACAAGT ACACAATCTG AAATTGCAAA CTTCAGTGGT	5700
	TTGTTAGGGC GTGTCCTAAC TGAAATGCGT CTTGTTAAAA TATCAAATAC AGAGCGTCTT	5760
	GAATTAGATA ATGCACATAA AAATTTGAAT GAAATATATA AATTAGGTTT AAAACAGGCT	5820
25	AAAATTGCGG CAGTTGTACA ACCAATTTCA GGTATAGTTA TGTGCTAAC AATTGCAATT	5880
	ATTTTAGGTT TTGGTGCATT AGAAATTGCG ACTGGTGCAA TCACTGCAGG TACATTAATT	5940
	GCAATGATAT TTTATGTTAT TCAGTTATCT ATGCCTTTAA TCAATCTTTC CACGTTAGTT	6000
30	ACAGATTATA AAAAGGCACT CGGTGCAAGT AGTAGAATAT ACGAAATCAT GCAAGAACCT	6060
	ATTGAACCGA CAGAAGCTCT TGAAGATTCT GAAAATGTAT TAATTGATGA CGGTGTATTG	6120
	TCATTTGAAC ATGTAGACTT TAAATATGAT GTGAAGAAAA TATTAGATGA TGTGTCGTTT	6180
35	CAAATCCAC AAGGTCAAGT GAGTGCTTTT GTAGGCCCTT CTGGGTCTGG TAAAAGTACG	6240
	ATATTTAATC TGATAGAACG TATGTATGAA ATTGAGTCAG GTGATATTAA ATATGGCCTT	6300
	GAAAGTGTCT ATGATATCCC GTTATCTAAG TGGCGACGCA AAATTGGATA TGTTATGCAA	6360
40	TCAAATTCGA TGATGAGTGG TACAATTAGA GACAATATTT TATACGGAAT TAATCGTCAT	6420
	GTTTCAGATG AAGAACTTAT TAATTATGCT AAATTAGCGA ACTGTCATGA TTTTATCATG	6480
45	CAATTTGATG AAGGATATGA CACGCTTGTA GGTGAACGAG GATTGAAACT GTCTGGCGGA	6540
	CAACGTCAAC GTATTGATAT TGCTAGAAGT TTTGTTAAAA ATCCTGATAT TTTGTTACTT	6600
	GATGAAGCAA CAGCTAATCT CGATAGTGAA AGTGAATTGA AAATTCAAGA AGCTTTAGAA	6660
50	ACATTGATGG AAGGTAGAAC AACGATTGTC ATTGCGCATC GTTGCTCTAC AATTAAAAAA	6720
	GCCGGTCAAA TTATATTCTT AGACAAAGGA CAGGTAACAG GTAAAGGTAC GCATTCAGAA	6780

55

EP 0 786 519 A2

	TTTTATATAT ATAAGTAAGC TTGGAGCAAA TACACATATA CCATCGAGGA AATTAAAGTG	6900
	TGGCACATTG ATGGATATAG ATGTTAATAA ATTGCTTCAA GCTTTTGTCT ATTTTAAATC	6960
5	ATTTGAGAAG TTACGACATA ATAATTCTTA AATTAATGAA ATCGATATTT TAAGAAAAAA	7020
	ATGCTCATGG TATAATACAA GTTATAAGCA AACATACATA TATTAAATAC TGTAGCCACG	7080
	AGTCATAATT CTTCATATTT TACATAGCAA TTAACTGAT TTTAGAGTCC ACGGTACAGA	7140
10	AGTTTGATAT TTCAATGTTT CTAAATTTTT AAAAATTAA ATCATAGGTG GGTGCCAAAT	7200
	GTTTTTATTA ATCAACATTA TTGGTCTAAT TGTATTTCTT GGTATTGCGG TATTATTTTC	7260
	AAGAGATCGC AAAAATATCC AATGGCAATC AATTGGGATC TTAGTTGTTT TAAACCTGTT	7320
15	TTTAGCATGG TTCTTTATTT ATTTTGATTG GGGTCAAAAA GCAGTAAGAG GAGCAGCCAA	7380
	TGGTATCGCT TGGGTAGTTC AGTCAGCGCA TGCTGGTACA GGTTTTGCAT TTGCAAGTTT	7440
	GACAAATGTT AAAATGATGG ATATGGCTGT TGCAGCCTTA TTCCAATAT TATTAATAGT	7500
20	GCCATTATTT GATATCTTAA TGTACTTTAA TATTTTACCG AAAATTATTG GAGGTATTGG	7560
	TTGGTTACTA GCTAAAGTAA CAAGACAACC TAAATTCGAG TCATTCTTTG GGATAGAAAT	7620
25	GATGTTCTTA GGAAATACTG AAGCATTAGC CGTATCAAGT GAGCAACTAA AACGTATGAA	7680
	TGAAATGCGT GTATTAACAA TCGCAATGAT GTCAATGAGC TCTGTATCGG GAGCTATTGT	7740
	AGGTGCGTAT GTACAAATGG TACCAGGAGA ACTGGTACTA ACGGCAATTC CACTAAATAT	7800
30	CGTTAACGCG ATTATTGTGT CATGCTTGTT GAATCCAGTA AGTGTTGAAG AGAAAGAAGA	7860
	TATTATTTAC AGTCTTAAAA ACAATGAAGT TGAACGTCAA CCATTCTTCT CATTCTTGG	7920
	AGATTCTGTA TTAGCAGCAG GTAAATTAGT ATTAATCATC ATCGCATTG TTATTAGTTT	7980
35	TGTAGCGTTA GCTGATCTAT TTGATCGTTT TATCAATTTG ATTACAGGAT TGATAGCAGG	8040
	ATGGATAGGC ATAAAAGGTA GTTTCGGTTT AAACCAAATT TTAGGTGTGT TTATGTATCC	8100
	ATTTCGCGTA TTA CTGGTT TACCTTATGA TGAAGCGTGG TTGGTAGCAC AACAAATGGC	8160
40	TAAGAAAATT GTTACAAATG AATTTGTTGT TATGGGTGAA ATTTCTAAAG ATATTGCATC	8220
	TTATACACCA CACCATCGTG CGGTTATTAC AACATTCTTA ATTTCAATTG CAACTTCTC	8280
	AACGATTGGT ATGATTATCG GTACATTGAA AGGCATTGTT GATAAAAAGA CATCAGACTT	8340
45	TGTATCTAAA TATGTACCTA TGATGCTATT ATCAGGTATC CTAGTTTCAT TATTAACAGC	8400
	AGCTTTCGTT GGTTTATTG CATGGTAATA TGTCGAAGAG TGA CTATGAT AATACATTTT	8460
50	AACTAATAAA TATGTCCAGG CATGTCGTCT ATTGATATAG GTGAGATGCT TGGACTTTTT	8520
	TATTATTGAT ATAAAGGTAT nTAAATATTT TTAAAGTTAC CGAAATTGAA GCATTATAAA	8580

55

GACAGTAAGG ACTAGGTACA GTCATAGTAC TTCGAGCAAA ATTTGTTTGG TTATTATAAA 8700
 CAACACAAAG GAGATAACTT CTCTAnTGAA GAAGTTAAAA ACATTATAGC AGACAATGAA 8760
 5 ATGAAAGTAA ATTAAAAAT 8779

(2) INFORMATION FOR SEQ ID NO: 59:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31096 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 59:

GTTGCAGTAG TCAAAGAATT AAACAAGGTG AAGGcGTGTA GCTTGACACAC CCGAAAATGT 60
 20 GCGTAAGTTA aCGGATGCAG GACATAAAGT AATTGTTGAA AAAAAATGCTG GCATTGGTTC 120
 AGGATTTTCT AACGATATGT ATGAAAAAGA AGGCGCTAAG ATCGTAACTC ACGAACAAGC 180
 ATGGGAAGCT GATCTTGTTA TCAAAGTAAA AGAACCTCAT GAAAGCGAAT ATCAATATTT 240
 25 CAAAAAGAAT CAAATTATCT GGGGATTTTT ACATCTAGCA TCTTCAAAG AAATAGTAGA 300
 AAAAATGCAA GAAGTTGGTG TAACTGCGAT TAGTGGTGAA ACCATTATAA AAAATGGAAA 360
 AGCAGAATTA TTAGCGCCAA TGAGTGCTAT AGCAGGTCAA CGCTCAGCAA TTATGGGAGC 420
 30 TTACTACTCT GAAGCACAAAC ATGGTGGTCA AGGTACTTTA GTGACTGGTG TACATGAAAA 480
 TGTGGATATA CCTGGTAGTA CATATGTGAT TTTCGGTGGT GGAGTAGCAG CAACAAATGC 540
 AGCAAATGTT GCCTTGGGAC TAAATGCTAA AGTAATCATT ATCGAGTTAA ACGATGACCG 600
 35 CATTAAATAT CTTGAAGATA TGTATGCAGA AAAAGATGTC ACAGTAGTCA AATCAACACC 660
 AGAAATTTA GCAGAACAAA TTAAGAAAGC AGATGTATTT ATTTCTACAA TTTTAATTC 720
 AGGTGCGAAA CCGCCAAAAT TGGTACTCG TGAGATGGTT AAATCAATGA AAAAAGGTTT 780
 40 AGTATTAATC GATATAGCTA TTGACCAAGG TGGAAGTATT GAAACAATTA GACCAACTAC 840
 AATTTCTGAT CCAGTGTATG AAGAAGAAGG TGTGATTCAT TATGGTGTAC CAAATCAACC 900
 45 AGGAGCAGTC CCAAGAACTT CAACAATGGC ATTAGCACAA GGAAATATTG ATTATATATT 960
 AGAAATTTGT GACAAAGGCT TAGAACAAGC AATTAAAGAT AATGAAGCCT TAAGTACTGG 1020
 TGTAACATT TACCAAGGAC AAGTGACAAA TCAAGGATTA GCTTCATCAC ATGACCTAGA 1080
 50 TTATAAGAA ATATTAAATG TTATCGAATA GATAGTAATT TAAATGAAAT TGAGTGAAAT 1140
 GAATATTTTA AATATAGCAT TATAGTTTGG ACTAAAAATT TACAAAACGG AAGGATGTAA 1200

EP 0 786 519 A2

	TCGAAGAAGC TAAAGCAAGC ATTAAACCAT TTATTCGTCG AACACCTCTA ATTAAATCAA	1320
	TGTATTTAAG CCAAAGTATA ACTAAAGGGA ATGTATTTCT AAAATTAGAA AATATGCAAT	1380
5	TCACAGGATC TTTTAAATTT AGAGGCGCTA gCAATnAAAA TTAATCACTT AACAGATGAA	1440
	CAAAAAGAAA AAGGCATTAT CGCAGCATCT GCTGGGgAAC CATGCACAAG GTGTTGCTTT	1500
	AACAGCTAAA TTATTAGGCA TTGATGCAAC GATTGTAATG CCTGAAACAG CACCACAAGC	1560
10	GAAACAACAA GCAACAAAAG GCTATGGGGC AAAGGTTATT TTAAGGTA AAACTTTAA	1620
	CGAACTAGA CTTTATATGG AAGAATTAGC GAAAGAAAAT GGCATGACAA TCGTTCATCC	1680
	ATATGACGAT AAGTTTGTA TGGCAGGCCA AGGAACAATT GGTTTAGAAA TTTTAGATGA	1740
15	TATTTGGAAT GTGAATACAG TCATCGTACC AGTTGGCGGT GGAGGATTAA TTGCAGGTAT	1800
	TGCCACCGCA TTAAATCAT TTAACCCCTC AATTCATATT ATCGGTGTTT AATCTGAGAA	1860
20	TGTTTCATGGT ATGGCTGAGT CTTTCTATAA GAGAGATTTA ACTGAACATC GAGTGGATAG	1920
	CACAATAGCA GATGGTTGTG ATGTAAAGT TCCTGGTGAA CAAACATATG AAGTAGTTAA	1980
	ACATTTAGTA GATGAATTTA TTCTTGTTAC TGAAGAAGAA ATTGAACATG CTATGAAAGA	2040
25	TTTAATGCAG CGTGCCAAAA TTATTACTGA AGGTGCAGGC GCATTACCAA CAGCTGCAAT	2100
	TTTAAGTGA AAAATAACA ATAAATGGCT TGAAGATAAA AATGTTGTTG CATTAGTTTC	2160
	AGGCGGGAAT GTTGACTTAA CTAGAGTTTC AGGTGTCATT GAACATGGAC TGAATATTGC	2220
30	AGATACAAGC AAGGTTGTGG TAGGTTAAAA CATTTAATCT TAAAAATGAG GTGTAATTAT	2280
	GTCAAATGGT AAAGAATTAC AAAAAATAT AGGTTTCTTC TCAGCGTTTG CTATTGTTAT	2340
	GGGACAGTT ATTGGTTCAG GAGTATTCTT TAAAATATCA AACGTAACAG AAGTAACAGG	2400
35	AACAGCAGGA ATGGCCTTGT TTGTATGGTT CCTAGGCGGC ATCATTACCA TTTGTGCGGG	2460
	GTTAACAGCA GCAGAACTTG CTGCTGCAAT CCCTGAAACA GGTGGCTTAA CGAAGTATAT	2520
	AGAATATACA TACGGTGATT TCTGGGGCTT CCTATCAGGT TGGGCGCAAT CATTTATTTA	2580
40	TTTTCCAGCT AACGTAGCAG CATTGTCTAT CGTATTTGCG ACACAGCTAA TTAATTTATT	2640
	CCATTTATCT ATAGGTTTCGT TAATACCAAT AGCAATCGCA TCTGCGTTAT CTATTGTGTT	2700
45	GATAAATTC CTAGGTTCAA AAGCAGGCGG AATTTTACAA TCAGTTACTT TAGTAATTAA	2760
	ACTGATTCCA ATCATCGTTA TTGTAATTTT TGGTATTTT CAATCTGGAG ATATCACTTT	2820
	TTCAATTAATT CCAACTACAG GTAATTCaGG AAATGGCTTC TTTACAGCAA TTGGTAGTGG	2880
50	TTTATTAGCA ACTATGTTTG CATATGATGG TTGGATTCAT GTAGGAAATG TTGCGGGGGA	2940
	ACTTAAAAAT CCTAACGCG ATTTACCTTT AGCGATTTCa GTTGGTATCG GTTGTATTAT	3000

55

EP 0 786 519 A2

	TGGTAATTTA AATGCAGCTT CAGATACATC AAAAATATTA TTTGGTGAAA ATGGCGGTAA	3120
	GATTATTACA ATCGGTATAT TAATTTCTGT TTATGGTACG ATCAATGGCT ATACTATGAC	3180
5	TGGTATGCCG GTACCATATG CAATGGCTGA AAGAAAATTA TTGCCATTTA GCCATTTATT	3240
	CGCAAAATTA ACAAATCTG GCGCACCATG GTTTGGCGCA ATTATACAAC TTATAATCGC	3300
	TATCATCATG ATGTCAATGG GAGCATTTGA TACAATTACA AATATGTTAA TCTTTGTTAT	3360
10	TTGGTTGTTC TATTGTATGT CATTTGTTGC GGTAATAATT TTAAGAAAAC GTGAACCAAA	3420
	TATGGAACGA CCATATAAAG TACCGTTATA TCCGATCATA CCTTTAATTG CTATTTTGGC	3480
	AGGATCAITT GTATTAATTA ATACACTGTT TACACAATTT ATATTAGCAA TCATTGGAAT	3540
15	TCTAATAACA GCACTTG GTA TACCAGTTTA TTACTATAAA AAGAAACAAA AAGCAGCATA	3600
	AGGTAAGATA ACTAGCATTG AGAATAAATG GATGGACTAC TAATAAATTT AAAGTTTAC	3660
20	ACATTAAAT CAAAAACCAT TCAATTATTC TATGGAACAG ACAAATTTCT GTTATGGAAT	3720
	TTGTCTGTTT TTCAAAAGTA TAGGGAGGCA AATAGAGATG GAAAAGCCGT CAAGAGAGGC	3780
	ATTTGAAGGC AATAATAAGT TGTTAATAGG AATTGTTCTA AGTGTAATAA CGTTTTGGCT	3840
25	ATTTGCACAA TCATTGGTTA ATGTTGTACC AATACTTGAA GATAGTTTCA ATACAGATAT	3900
	TGGAACGGTT AATATCGCCG TTAGTATAAC TGCTTTATTT TCAGGAATGT TTGTAGTAGG	3960
	AGCAGGTGGT CTTGCTGATA AATATGGCAG AATTAACTC ACGAACATTG GTATTATCTT	4020
30	AAATATATTA GGTTCATTAT TAATCATTAT TTCAAATATT CCTTTATTAC TTATTATAGG	4080
	AAGATTAATT CAAGGACTTT CAGCAGCATG TATTATGCCT GCAACTTTGT CTATTATTAA	4140
	GTCATATTAC ATTGGGAAAG ATAGACAACG CGCTTTAAGT TATTGGTCAA TTGGCTCATG	4200
35	GGGCGGCTCT GGTGTTTGT CATTTTTTGG AGGTGCAGTT GCAACGCTTT TAGGTTGGCG	4260
	TTGGATTTTC ATCCTATCAA TTATAATTTT ATTAATTGCA CTGTTTCTTA TTAAAGGCAC	4320
	ACCTGAACT AAATCTAAAT CGATTTCTCT AAATAAATTT GACATTAAAG GTCTGGTTCT	4380
40	TTTAGTCATT ATGCTCCTCA GTTTAAATAT TTTAATTACT AAAGGATCAG AATTAGGTGT	4440
	AACCTCACTT CTTTTTATTA CTTTATTAGC TATTGCAATT GGATCTTTTA GTTTATTTAT	4500
45	AGTTCTTGAA AAGCGTGCTA CAAATCCTTT AATCGATTTT AAATTATTTA AAAATAAAGC	4560
	TTACACAGGT GCAACAGCTT CAAACTTTTT GTTAAATGGT GTTGCAGGAA CATTAAATAGT	4620
	AGCCAACACA TTTGTTCAAA GAGGTTTAGG ATATTCTTCA TTGCAAGCAG GAAGTTTATC	4680
50	AATCACTTAT TTAGTAATGG TACTAATTAT GATTCGTGTT GGTGAAAAGT TACTTCAAAC	4740
	ACTCGGATGC AAGAAACCAA TGTTAATTGG AACAGGAGTT CTTATTGTCT GAGAATGTCT	4800
55		

	ATTCTTTGGT TTAGGACTAG GGATATATGC TACACCATCA ACAGATACAG CAATTGCAAA	4920
	TGCACCGTTA GAAAAAGTAG GCGTTGCTGC AGGTATCTAT AAAATGGCTT CTGCATTAGG	4980
5	TGGAGCATT TGGCGTCGCAT TGACTGGTGC AGTATATGCA ATCGTATCAA ATATGaCAAA	5040
	CATTTATACA GGTGcAATGa TTGnCATTAT GGTTaAATGC AGGTATGGGa ATATTATCaT	5100
	TCGTTATCAT TTTGtTACTT GTGcCTAAAC mAAACGACAC TCAATTATGA TAATTGAGAA	5160
10	TTAAATTGAA ATCATACAAG TCGCTACAAT ATTAAACAAA AATATAAACC GATTCTTATG	5220
	TGTCATTAT TTAATGAAC ATAGGGATTG GTTTTTTATT ACTCTTTTAC GCTACTTTAT	5280
	TTATAATTAT TATAAATTGT CACAAATTCA ATTTACCTTA CAATATATTT TGTGTTATTA	5340
15	TATTCTGGAG CATAAATAAA TTGTTCAACA CATAGTTGTA ATGTGTTTCA ATACTTTTTG	5400
	GATAGATTGC GAAATTGTAT TGAATCGTCA TCGTTTTAAA TTTTAAATG AGAATGGAAT	5460
20	GAGCATTACA ATACACAAGC AATCAAAAGT AAATACATTC ACAACACAAC AGAGACATAA	5520
	CAACAAGATA AGGAGTGAAC AATAGCTGTG AATTATCGTG ATAAAATTCA AAAGTTTAGT	5580
	ATTCGTAAAT ATACAGTTGG TACATTTTCA ACTGTCATTG CGACATTGGT ATTTTtagGA	5640
25	TTCAATACAT CACAAGCACA TGCTGCTGAA ACAAATCAAC CAGCAAGCGT GGTAAACAG	5700
	AAACAACAAA GTAATAATGA ACAGACTGAG AATCGAGAAT CTCAAGTACA AAATTCTCAA	5760
	AATTCACAAA ATGGTCAATC ATTATCTGCT ACTCATGAAA ATGAGCAACC AAATATTAGT	5820
30	CAAGCTAATT TAGTAGATCA AAAAGTAGCG CAATCATCTA CTAATAATGA TGAACAACCA	5880
	GCATCTCAA ATGTAAATAC AAAGAAAGAT TCGGCAACGG CTGCGACAAC ACAACCAGAT	5940
	AAAGAACAAA GTAAGCATAA ACAAACGAA AGTCAATCTG CTAATAAAAA TGGAAACGAC	6000
35	AATAGAGCGG CTCATGTAGA AAATCATGAA GCAAATGTAG TAACAGCTTC AGATTCATCT	6060
	GATAATGGTA ACGTACAACA TGACCGAAAT GAATTACAAG CGTTTTTTGA TGCAAATTAT	6120
40	CATGATTATC GCTTTATTGA CCGTGAAAAT GCAGATTCTG GCACATTTAA CTATGTAAAA	6180
	GGCATTTTTG ATAAGATTAA TACGTTATTA GGCAGTAATG ATCCAATAAA CAATAAGAC	6240
	TTGCAACTTG CATACAAAGA ATTGGAACAA GCTGTTGCTT TAATTCGTAC AATGCCTCAA	6300
45	CGTCAACAGA CTAGCCGACG TTCAAATAGA ATTCAAACGC GTTCGGTTGA GTCAAGAGCT	6360
	GCAGAGCCTA GATCAGTATC AGACTATCAA AATGCAAATT CATCATATTA TGTGAAAAT	6420
	GCTAATGATG GTTCGGGCTA TCCTGTTGGT ACATATATCa ATGCTTCTAG TAAAGGGGCG	6480
50	CCATATAATT TACCAACTAC ACCATGGAAT ACATTGAAGG CCTCTGACTC AAAGGAAATT	6540
	GCTCTTATGA CAGCGAAACA AACTGGAGAC GGGTACCAAT GGGTTATTAA GTTTAATAAA	6600

55

EP 0 786 519 A2

	GTAGGAAGAA CTGACTTTGT AACAGTTAAT TCAGATGGAA CAAATGTACA ATGGAGTCAT	6720
	GGAGCAGGAG CAGGTGCAAA TAAACCACTT CAACAAATGT GGAATATGG AGTAAATGAT	6780
5	CCTCATCGTT CACATGACTT TAAAATAAGA AATAGAAGTG GCCAAGTAAT ATATGACTGG	6840
	CCAACTGTCC ATATTTATTC TTTAGAAGAT TTATCTAGAG CGAGTGATTA TTTTAGTGAA	6900
	GCTGGAGCGA CACCTGCTAC TAAAGCTTTT GGTAGACAAA ATTTTGAATA TATTAATGGT	6960
10	CAAAAACCTG CTGAATCACC GGGTGTTCCT AAAGTTTATA CTTTCATCGG TCAAGGTGAT	7020
	GCAAGTTATA CAATTTTATT TAAACACAA GGTCCAACCTG TTAATAAATT GTACTATGCA	7080
	GCAGGTGGGC GTGCTTTAGA GTACAATCAA TTATTTATGT ACAGTCAACT ATACGTCGAA	7140
15	TCAACGCAAG ACCATCAACA ACGTCTTAAT GGTTTAAGAC AAGTGGTTAA TCGTACATAT	7200
	CGCATAGGTA CAACTAAACG TGTAAGAGTG AGTCAAGGAA ATGTACAAAC GAAAAAGGTA	7260
	TTAGAAAGTA CAAACCTAAA TATAGATGAT TTTGTTGATG ATCCTTTAAG TTATGTTAAG	7320
20	ACGCCGAGTA ATAAAGTGTT AGGATTTTAT TCGAATAATG CAAATACTAA TGCTTTTAGA	7380
	CCGGGTGGAG CCCAACCAAT AAATGAATAT CAATTAAGTC AATTATTTAC TGATCAAAAA	7440
	TTACAAGAAG CAGCAAGAAC TAGAAACCCA ATAAGATTAA TGATTGGTTT CGACTATCCT	7500
25	GATGCTTATG GTAATAGTGA ACTTTAGTTC CTGTTAACTT AACGGTATTA CCTGAAATCC	7560
	AACATAATAT TaAATTCTTT AAAAATGACG ATACTCAAAA TATTGCTGAA AAACCATTTT	7620
30	CAAAACAAGC TGGGCATCCA GTTTTCTATG TATATGCAGG TAACCAAGGG AATGCTTCCG	7680
	TGAATTTAGG TGGTAGCGTA ACATCTATTC AACCATACG TATTAATTTA ACAAGTAATG	7740
	AGAATTTTAC AGATAAAGAT TGGCAAATTA CAGGTATTCC GCGTACATTA CACATTGAAA	7800
35	ACTCGACAAA TAGACCTAAT AATGCCAGAG AACGCAATAT TGAACCTGTT GGTAACCTAT	7860
	TACCGGGGGA TTACTTTGGA ACGATACGTT TTGGACGTAA AGAACAATTA TTCGAAATTC	7920
	GTGTTAAACC ACATACACCA ACAATTACAA CGACAGCTGA GCAATTAAGA GGTACAGCAT	7980
40	TACAAAAAGT GCCTGTTAAT ATTTCTGGGAA TACCGTTGGA TCCATCGGCA TTGGTTTATT	8040
	TAGTTGCACC AACAAATCAA ACTACGAATG GTGGTAGTGA GGCAGATCAA ATACCATCTG	8100
	GTTATACGAT ACTTGCGACT GGTACACCTG ATGGGGTGCA TAATACAATT ACTATACGAC	8160
45	CGCAAGATTA TGTGTATTTC ATACCACCTG TAGGTAAACA AATTAGAGCA GTAGTTTATT	8220
	ATAATAAAGT AGTTGCATCT AATATGAGTA ATGCTGTTAC TATTTTGCCA GATGACATTC	8280
50	CACCAACAAT CAATAATCCT GTTGAATAA ATGCCAAATA CTATCGAGGC GACGAACCAA	8340
	CTTTACAATG GGTGTCTCTG ATAGACATTC TGGTATAAAA AATACAATA TTACGACATT	8400

55

EP 0 786 519 A2

	TACAGGTAGA GTGAGTATGA ATCAGGCATT TAACAGTGAT ATTACATTTA AAGTGTGAGC	8520
	GACAGaCAAT GTCAATAATA CGACAAATGA TAGTCAATCT AAACATGTTT CAATTCATGT	8580
5	AGGTAAAATT AGTGAAGATG CTCATCCGAT TGTATTAGGA AATACTGAGA AAGTTGTAGT	8640
	AGTCAATCCG ACTGCTGTAT CTAATGATGA AAAGCAAAGC ATAATTACTG CCTTTATGAA	8700
	TAAAAACCAA AATATAAGAG GATATTTAGC ATCAACTGAT CCAGTAACTG TCGATAATAA	8760
10	TGGTAATGTC ACATTACATT ACCGTGATGG CTCATCGACA ACGCTTGATG CTACAAATGT	8820
	GATGACATAC GAACCAGTTG TGAAACCTGA ATACCAAACGT GTCAATGCTG CTAAAAACAGC	8880
	AACGGTAACG ATTGCTAAAG GACAATCATT TAGTATTGGT GATATTAAAC AATATTTTAC	8940
15	TTTAAGTAAT GGACAACCTA TTCCAAGTGG CACATTTACA AATATTACAT CTGATAGAAC	9000
	TATTCCAACG GCACAAGAAG TTAGTCAAAT GAACGCAGGC ACGCAGTTAT ACCATATAAC	9060
20	TGCTACAAAT GCGTATCATA AAGATAGTGA AGACTTCTAT ATTAGTTTGA AAATCATCGA	9120
	TGTGAAACAA CCAGAAGGCG ATCAACGTGT ATATCGTACA TCAACATATG ATTTAACTAC	9180
	TGATGAAATC TCAAAAGTAA AACAAGCATT TATTAATGCA AATAGAGATG TAATTACGCT	9240
25	TGCCGAAGGT GATATTTTCA TTACAAATAC ACCTAATGGT GCTAATGTAA GTACTATTAC	9300
	AGTAAATATT AATAAAGGTC GATTAACGAA ATCATTGCGG TCAAACCTAG CTAATATGAA	9360
	TTTCTTGCGT TGGGTTAATT TCCCACAAGA TTATACAGTG ACATGGACGA ATGCAAAAAT	9420
30	TGCAACAGTA CCAACAGATG GTGGTTTATC ATGGTCTGAT GACCATAAAT CTTTAATTTA	9480
	TCGTTATGAT GCTACATTAG GTACTCAAAT TACGACGAAT GATATTTTAA CAATGTTAAA	9540
	AGCAACAACG ACAGTGCCCTG GATTGCGAAA TAACATTACT GGTAAATGAAA AATCACAAGC	9600
35	AGAAGCTGGC GGAAGACCTA ACTTTAGAAC GACTGGTTAT TCACAATCAA ATGCGACAAC	9660
	TGATGGTCAA CGTCAATTTA CGTTGAATGG TCAAGTGATT CAAGTGTTAG ACATCATCAA	9720
	CCCTTCAAAC GGTTATGGTG GGCAACCTGT TACAAATTCA AATACTCGTG CAAACCATAG	9780
40	TAACCTCACT GTTGTTAACG TAAACGAACC GGCAGCTAAT GGTGcTGGCG CATTTACAAT	9840
	TGACCACGTT GTAAAAAGTA ATTCTACACA TAATGCAAGT GATGCAGTTT ATAAAGCACA	9900
45	GTTATACTTA ACGCCATATG GTCCAAAACA ATATGTTGAA CATTTAAATC AAAATACAGG	9960
	AAATACTACT GACGCTATTA ACATTTATTT TGTACCAAGT GACTTAGTGA ATCCAACAAT	10020
	TTCAGTAGGT AATTACACTA ATCATCAAGT GTTCTCAGGT GAAACATTTA CAAATACTAT	10080
50	TACAGCGAAT GATAACTTTG GTGTGCAATC TGTAAGTGTA CCAAATACAT CACAAATTAC	10140
	AGGTACTGTT GATAATAACC ATCAACATGT TTCTGCAACG GCACCAAATG TGACATCAGC	10200

55

EP 0 786 519 A2

	GTTCAATGTA ACAGTGAAAC CTTTGCGTGA TAAATATCGA GTTGGTACTT CATCAACGGC	10320
	TGCTAATCCT GTGAGAATTG CCAATATTTT GAATAATGCG ACAGTATCAC AAGCTGATCA	10380
5	AACGACAATT ATTAATTCGT TAACGTTTAC TGAAACAGTA CCAAATAGAA GTTATGCAAG	10440
	AGCAAGTGCG AATGAAATCA CTAGTAAAC AGTTAGTAAT GTCAGTCGTA CTGGAAATAA	10500
	TGCCAATGTg CACAGTAACT GTTACTTATC AAGATGGAAC AACATCAACA GTGACTGTAC	10560
10	CTGTAAAGCA TGTCATTCCA GAAATCGTTG CACATTGCGA TTACTACTGTA CAAGGCCAAG	10620
	ACTTCCCAGC AGGTAATGGT TCTAGTGCAT CAGATTACTT TAAGTTATCT AATGGTAGTG	10680
	ACATTGCAGA TGCAACTATT ACATGGGTAA GTGGACAAGC GCCAAATAAA GATAATACAC	10740
15	GTATTGGTGA AGATATAACT GTAACGTCAC ATATCTTAAT TGATGGCGAA ACAACGCCGA	10800
	TTACGAAAAC AGCAACATAT AAAGTAGTAA GAACTGTACC GAAACATGTC TTTGAAACAG	10860
	CCAGAGGTGT TTTATACCCA GGTGTTTCAG ATATGTATGA TGCGAAACAA TATGTTAAGC	10920
20	CAGTAAATAA TTCTTGGTCG ACAAATGCGC AACATATGAA TTTCCAATTT GTTGAACAT	10980
	ATGGTCCTAA CAAAGATGTT GTAGGCATAT CTACTCGTCT TATTAGAGTG ACATATGATA	11040
25	ATAGACAAAC AGAAGATTTA ACTATTTTAT CTAAGGTAA ACCTGACCCA CCTAGAATTG	11100
	ACGCAAATC TGTGACATAT AAAGCAGGTC TTACAAACCA AGAAATTAAA GTTAATAACG	11160
	TATTAAATAA CTCGTCAGTA AAATTATTTA AAGCAGATAA TACACCATTA AATGTCACAA	11220
30	ATATTACTCA TGGTAGCGGT TTTAGTTCGG TTGTGACAGT AAGTGACGCG TTACCAAATG	11280
	GCGGAATTAA AGCAAAATCT TCAATTTCAA TGAACAATGT GACGTATACG ACGCAAGACG	11340
	AACATGGTCA AGTTGTTACA GTAACAAGAA ATGAATCTGT TGATTCAAAT GACAGTGCAa	11400
35	CAGTAACAGT GACACCACAA TTACAAGCAA CTAAGAAGG CGCTGTATTT ATTAAAGGTG	11460
	GCGAAGGTTT TGATTTTCGGA CACGTAGAAA GATTTATTCA AAACCCGCCA CATGGGGCAA	11520
	CGGTGTCATG GCATGATAGT CCAGATACAT GGAAGAATAC AGTCGGTAAC ACTCATAAAA	11580
40	CTGCGGTTGT AACATTACCT AATGGTCAAG GTACGCGTAA TGTTGAAGTT CCAGTCAAAG	11640
	TTTATCCAGT TGCTAATGCA AAGGCGCCAT CACGTGATGT GAAAGGTCAA AATTGACTA	11700
45	ATGGAACGGA TGCGATGAAC TACATTACAT TTGATCCAAA TACAAACACA AATGGTATCA	11760
	CTGCAGCATG GGCAATAGA CAACAACCAA ATAACCAACA AGCAGGCGTG CAACATTTAA	11820
	ATGTCGATGT CACATATCCA GGTATTTTCAG CTGCTAAACG AGTTCCTGTT ACTGTTAATG	11880
50	TATATCAATT TGAATCCCT CAACTACTT ATACGACAAC GGTGGAGGC ACTTTAGCAA	11940
	GTGGTACGCA AGCATCAGGA TATGCACATA TGCAAAATGC TACTGGTTTA CCAACAGATG	12000
55		

	TGAATAAACC GAATGTGGCT AAAGTCGTTA ACGCAAATA TGACGTCATC TATAACGGAC	12120
	ATACTTTTGC AACATCTTTA CCAGCGAAAT TTGTAGTAAA AGATGTGCAA CCAGCGAAAC	12180
5	CAACTGTGAC TGAAACAGCG GCAGGAGCGA TTACAATTGC ACCTGGAGCA AACCAAACAG	12240
	TGAATACACA TGCCGGTAAC GTAACGACAT ACGCTGATAA ATTAGTTATT AAACGTAATG	12300
	GTAACGTGTG GACGACATTT ACACGTCGCA ATAATACGAG TCCATGGGTG AAAGAAGCAT	12360
10	CTGCAGCAAC TGTAGCAGGT ATTGCTGGAA CTAATAATGG TATTACTGTT GCAGCAGGTA	12420
	CTTTCAACCC TGCTGATACA ATTCAAGTTG TTGCAACGCA AGGAAGCGGA GAGACAGTGA	12480
15	GTGATGAGCA ACGTAGTGAT GATTTTCACAG TTGTCGCACC ACAACCGAAC CAAGCGACTA	12540
	CTAAGATTTG GCAAAATGGT CATATTGATA TCACGCCTAA TAATCCATCA GGACATTTAA	12600
	TTAATCCAAC TCAAGCAATG GATATTGCTT AACTTGAAAA AGTGGGTAAT GGTGCAGAAC	12660
20	ATAGTAAGAC AATTAATGTT GTTCGTGGTC AAAATAATCA ATGGACAATT GCGAATAAGC	12720
	CTGACTATGT AACGTTAGAT GCACAACTG GTAAAGTGAC GTTCAATGCC AATACTATAA	12780
	AACCAAATTC ATCAATCACA ATTACTCCGA AAGCAGGTAC AGGTCACTCA GTAAGTAGTA	12840
25	ATCCAAGTAC ATTAAGTACA CCGGCAGCTC ATACTGTCAA CACAAGTAA ATTGTGAAAG	12900
	ATTATGGTTC AAATGTAACA GCAGCTGAAA TTAACAATGC AGTTCAAGTT GCTAATAAAC	12960
	GTACTGCAAC GATTAAAAAT GGCACAGCAA TGCCTACTAA TTTAGCTGGT GGTAGCACAA	13020
30	CGACGATTCC TGTGACAGTA ACTTACAATG ATGGTAGTAC TGAAGAAGTA CAAGAGTCCA	13080
	TTTTCACAAA AGCGGATAAA CGTGAGTTAA TCACAGCTAA AAATCATTTA GATGATCCAG	13140
	TAAGCACTGA AGGTAAAAAG CCAGGTACAA TTACGCAGTA CAATAATGCA ATGCATAATG	13200
35	CGCAACAACA AATCAATACT GCGAAAACAG AAGCACAACA AGTGATTAAT AATGAGCGTG	13260
	CAACACCACA ACAAGTTTCT GACGCACTAA CTAAAGTTCTG TGCAGCACAA ACTAAGATTG	13320
40	ATCAAGCTAA AGCATTACTT CAAAATAAAG AAGATAATAG CCAATTAGTA ACGTCTAAAA	13380
	ATAACTTACA AAGTTCTGTG AACCAAGTAC CATCAACTGC TGGTATGACG CAACAAAGTA	13440
	TTGATAACTA TAATGCGAAG AAGCGTGAAG CAGAACTGA AATAACTGCA GCTCAACGTG	13500
45	TTATTGACAA TGGCGATGCA ACTGCACAAC AAATTTTCAGA TGAAAAACAT CGTGTGATA	13560
	ACGCATTAAC AGCATTAAC CAAGCGAAAC ATGATTTAAC TGCAGATACA CATGCCTTAG	13620
	AGCAAGCAGT GCAACAATTG AATCGCACAG GTACAACGAC TGGTAAGAAG CCGGCAAGTA	13680
50	TTACTGCTTA CAATAATTCG ATTCGTGCAC TTCAAAGTGA CTTAACAAGT GCTAAAAATA	13740
	GCGCTAATGC TATTATTCAA AAGCCAATAA GAACAGTACA AGAAGTGCAA TCTGCGTTAA	13800

55

EP 0 786 519 A2

	CTGATAATAG TGCTTTAAAA ACTGCTAAGA CGAAACTTGA TGAAGAAATC AATAAATCAG	13920
	TAACACTGTA TGGTATGACA CAATCATCAA TCCAAGCATA TGAAAATGCT AAACGTGCGG	13980
5	GTCAAACAGA ATCAACAAAT GCACAAAATG TTATTAACAA TGGTGATGCG ACTGACCAAC	14040
	AAATTGCCGC AGAAAAAACA AAAGTAGAAG AAAAATATAA TAGCTTAAAA CAAGCAATTG	14100
	CTGGATTAACT TCCAGACTTG GCACCATTAC AAACGTGCAA AACTCAGTTG CAAAATGATA	14160
10	TTGATCAGCC AACGAGTACG ACTGGTATGA CAAGCGCATC TATTGCAGCA TTTAATGAAA	14220
	AACTTTCAGC AGCTAGAACT AAAATTCAAG AAATTGATCG TGTATTAGCC TCACATCCAG	14280
	ATGTTGCGAC AATACGTCAA AACGTGACAG CAGCGAATGC CGCTAAATCA GCACTTGATC	14340
15	AAGCAGTAA TGGCTTAACA GTCGATAAAG CGCCTTTAGA AAATGCGAAA AATCAACTAC	14400
	AACATAGTAT TGACACGCAA ACAAGTACAA CTGGTATGAC ACAAGACTCT ATAAATGCAT	14460
20	ACAATGCGAA GTTAACAGCT GCACGTAATA AGATTCAACA AATCAATCAA GTATTAGCAG	14520
	GTTCAACGAC TGTTAGAACA ATTAATACAA ATACGTCTAC AGCAAATCAA GCTAAATCTG	14580
	ATTTAGATCA TGCACGTCAA GCTTTAACAC CAGATAAAGC GCCGCTTCAA ACTGCGAAAA	14640
25	CGCAATTAGA ACAAAGCATT AATCAACCAA CGGATACAAC AGGTATGACG ACCGCTTCGT	14700
	TAAATGCGTA CAACCAAAAA TTACAAGCAG CGCGTCAAAA GTTAACTGAA ATTAATCAAG	14760
	TGTGAATGG CAACCCAACT GTCCAAAATA TCAATGATAA AGTGACAGAG GCAAACCAAG	14820
30	CTAAGGATCA ATTAAATACA GCACGTCAAG GTTTAACATT AGATAGACAG CCAGCGTTAA	14880
	CAACATTACA TGGTGATCT AACTTAAACC AAGCACAACA AAATAATTTC ACGCAACAAA	14940
	TTAATGCTGC TCAAAATCAT GctGCGCTTG AAACAATTAA GTCTAACATT ACGGCTTTAA	15000
35	ATACTGCGAT GACGAAATTA AAAGACAGTG TTGCGGATAA TAATACAATT AAATCAGATC	15060
	AAAATTACAC TGACGCAACA CCAGCTAATA AACAAGCGTA TGATAATGCA GTTAATGCGG	15120
40	CTAAAGGTGT CATTGGAGAA ACGACTAATC CAACGATGGA TGTTAACACA GTGAACCAAA	15180
	AAGCAGCATC TGTTAAATCG ACGAAAGATG CTTTAGATGG TCAACAAAAC TTACAACGTG	15240
	CGAAAACAGA AGCAACAAAT GCGATTACGC ATGCAAGTGA TTTAAACCAA GCACAAAAGA	15300
45	ATGCATTAACT ACAACAAGTG AATAGTGcAC AAAACGTGCA AGCAGTAAAT GATATTAAAC	15360
	AAACGACTCA AAGCTTAAAT ACTGCTATGA CAGGTTTAAA ACGTGGCGTT GCTAATCATA	15420
	ACCAAGTCGT ACAAAGTGAT AATTATGTCA ACGCAGATAC TAATAAGAAA AATGATTACA	15480
50	ACAATGCATA CAACCATGCG AATGACATTA TTAATGGTAA TGCACAACAT CCAGTTATAA	15540
	CACCAAGTGA TGTTAACAAT GCTTTATCAA ATGTCACAAG TAAAGAACAT GCATTGAATG	15600
55		

EP 0 786 519 A2

ATTTAAATAA TGCACAACGT CAAAACCTTAC AATCGCAAAT TAATGGTGCG CATCAAATTG 15720
 ATGCAGTTAA TACAATTAAG CAAAATGCAA CAAACTTGAA TAGTGCAATG GGTAACCTAA 15780
 5 GACAAGCTGT TGCAGATAAA GATCAAGTGA AACGTACAGA AGATTATGCG GATGCAGATA 15840
 CAGCTAAACA AAATGCATAT AACAGTGCG TTTCAAGTGC CGAAACAATC ATTAATCAAA 15900
 CAACAAATCC AACGATGTCT GTTGATGATG TTAATCGTGC AACTTCAGCT GTTACTTCTA 15960
 10 ATAAAAATGC ATTAAATGGT TATGAAAAAT TAGCACAATC TAAACAGAT GCTGCAAGAG 16020
 CAATTGATGC ATTACCACAT TTAAATAATG CACAAAAAGC AGATGTTAAA TCTAAAATTA 16080
 ATGCTGCATC AAATATTGCT GGCGTAAATA CTGTTAAACA ACAAGGTACA GATTTAAATA 16140
 15 CAKCGATGGg TAACCTGCAA GGTGCAATCA ATGATGAACA AACGACGCTT AATAGTCAAA 16200
 ACTATCAAGA TCGGACACCT AGTAAGAAAA CAGCATACAC AAATGCGGTA CAAGCTGCGA 16260
 AAGATATTTT AAATAAATCA AATGGTCAAA ATAAAACGAA AGATCAAGTT ACTGAAGCGA 16320
 20 TGAATCAAGT GAATTCTGCT AAAAATAACT TAGATGGTAC GCGTTTATTA GATCAAGCGA 16380
 nCAAaCAGCA AAACAGCAGT TAAATAATAT GACGCATTTA ACAACTGCAC AAAAAACGAA 16440
 25 TTAAACAAAC CAAATTAATA TGCGTACTAC TGTCGCTGGT GTTCAAACGG TTCAATCAAA 16500
 TGCCAATACA TTAGATCAAG CCATGAATAC GTTAAGACAA AGTATTGCCA ACAAAGATGC 16560
 GACTAAAGCA AGTGAAGATT ACGTAGATGC TAATAATGAT AAGCAAACAG CATATAACAA 16620
 30 CGCAGTAGCT GCTGCTGAAA CGATTATTAA TGCTAATAGT AATCCAGAAA TGAATCCAAG 16680
 TACGATTACA CAAAAAGCAG AGCAAGTGAA TAGTTCTAAA ACGGCACTTA ACGGTGATGA 16740
 AAACCTAGCT GCTGCAAAAC AAAATGCGAA AACGTACTTA AACACATTGA CAAGTATTAC 16800
 35 AGATGCTCAA AAGAACAATT TGATTAGTCA AATTACTAGT GCGACAAGAG TGAGTGGTGT 16860
 TGATACTGTA AAACAAAATG CGCAACATCT AGACCAAGCT ATGGCTAGCT TACAGAATGG 16920
 TATTAACAAC GAATCTCAAG TGAAATCATC TGAGAAATAT CGTGATGCTG ATACAAATAA 16980
 40 ACAACAAGAG TATGATAATG CTATTACTGC AGCGAAAGCG ATTTTAAATA AATCGACAGG 17040
 TCCAACACT GCGCAAAATG CAGTTGAAGC AGCATTACAA CGTGTTAATA ATGCGAAAGA 17100
 TGCATTGAAT GGTGATGCAA AATTAATTGC AGCTCAAAAC GCAGCGAAAC AACATTTAGG 17160
 TACTTTAACG CATATCACTA CAGCTCAACG TAATGATTTA ACAAATCAAA TTTCACAAGC 17220
 TACAACTTA GCTGGTGTG AATCTGTTAA ACAAATGCG AATAGTTTAG ATGGTGCTAT 17280
 50 GGGTAACTTA CAAACGGCTA TCAACGATAA GTCAGGAACA TTAGCGAGCC AAAACTTCTT 17340
 GGATGCTGAT GAGCAAAAAC GTAATGCATA CAATCAAGCT GTATCAGCAG CCGAAACCAT 17400

55

EP 0 786 519 A2

	TGTTAATAAT GCGAAACATG CATTAAATGG TACGCAAAAC TTAAACAATG CGAAACAAGC	17520
	AGCGATTACA GCAATCAATG GCGCATCTGA TTTAAATCAA AAACAAAAG ATGCATTAAA	17580
5	AGCACAAGCT AATGGTGCTC AACGCGTATC TAATGCACAA GATGTACAGC ACAATGCGAC	17640
	TGAACTGAAC ACGGCAATGG GCACATTAAA ACATGCCATC GCAGATAAGA CGAATACGTT	17700
	AGCAAGCAGT AAATATGTTA ATGCCGATAG CACTAAACAA AATGCTTACA CAACTAAAGT	17760
10	TACCAATGCT GAACATATTA TTAGCGGTAC GCCAACGGTT GTTACGACAC CTTCAGAAGT	17820
	AACAGCTGCA GCTAATCAAG TAAACAGCGC GAAACAAGAA TTAAATGGTG ACGAAAGATT	17880
	ACGTGAAGCA AAACAAAACG CCAATACTGC TATTGATGCA TTAACACAAT TAAATACACC	17940
15	TCAAAAAGCT AAATTAAAG AACAAAGTGGG ACAAGCCAAT AGATTAGAAG ACGTACAAAC	18000
	TGTTCAAACA AATGGACAAG CATTGAACAA TGCAATGAAA GGCTTAAGAG ATAGTATTGC	18060
20	TAACGAAACA ACAGTCAAAA CAAGTCAAAA CTATACAGAC GCAAGTCCGA ATAACCAATC	18120
	AACATATAAT AGCGCTGTGT CAAATGCGAA AGGTATCATT AATCAAACTA ACAATCCGAC	18180
	TATGGATACT AGTGCGATTA CCCAAGCTAC AACACAAGTG AATAATGCTA AAAATGGTTT	18240
25	AAACGGTGCT GAAAACTTAA GAAATGCACA AAACACTGCT AAGCAAACT TAAATACATT	18300
	ATCACACTTA ACAAATAACC AAAAATCTGC CATCTCATCA CAAATTGATC GTGCAGGTCA	18360
	TGTGAGTGAG GTAAGTCTA CTAAAAATGC AGCAACTGAG TTGAATACGC AAATGGGTAA	18420
30	CTTGAACAA GCTATCCATG ATCAAAACAC AGTTAAACAA AGTGTTAAAT TTAAGTATGC	18480
	AGATAAAGCT AAACGTGATG CGTATACAAA TGCGGTAAAG AGAGCTGAAG CAATTCTGAA	18540
	TAAAACGCAA GGTGCAAATA CGTCTAAACA AGATGTTGAA GCGGCTATTG AAAATGTTTC	18600
35	AAGTGCTAAA AATGCATTGA ATGGTGATCA AAACGTTACA AATGCGAAGA ATGCAGCTAA	18660
	AAATGCATTA AATAACTTAA CGTCAATTAA TAATGCACAA AAACGTGACT TAACAACTAA	18720
	AATTGATCAA GCAACAACTG TAGCTGGTGT TGAAGCTGTA TCTAATACGA GTACACAATT	18780
40	GAATACAGCG ATGGCTAACT TGCAAAATGG TATTAATGAT AAAACAAATA CACTAGCAAG	18840
	TGAAACTAT CATGATGCTG ATTCAGATAA GAAACTGCT TATACTCAAG CCGTTACGAA	18900
45	CGCAGAAAAT ATTTTAAATA AAAATAGTGG ATCAAATTTA GACAAAAGT CCGTTGAAAA	18960
	CGCGTTGTCA CAAGTTGCTA ATGCGAAAGG TGCCCTAAAT GGTAACCATA ATTTAGAGCA	19020
	AGCTAAATCA AATGCAACA CTACTATAAA CGGACTTCAA CATTTAACAA CTGCTCAAAA	19080
50	AGATAAATTG AAACAACAAG TGCAACAAGC ACAAATGTT GCAGGTGTAG ATACTGTTAA	19140
	ATCAAGTGCC AACACATTAA ATGGTGCTAT GGGTACGTTA AGAAATAGCA TACAAGATAA	19200

55

	TAACAATGCT GTTGATAGTG CTAATGGTGT CATTAAATGCA ACAAGCAATC CAAATATGGA	19320
	TGCTAATGCA ATTAACCAAA TCGCTACACA AGTGACATCA ACGAAAAATG CATTAGATGG	19380
5	TACACATAAT TTAACGCAAG CGAAACAAAC AGCAACAAAT GCCATCGATG GTGCTACTAA	19440
	CTTAAATAAA GCGCAAAAAG ATGCGTTAAA AGCACAAAGT ACAAGTGCGC AACGTGTTGC	19500
	AAATGTAACA AGTATCCAAC AAACCTGCAAA TGAACCTAAT ACAGCTATGG GTCAATTACA	19560
10	ACATGGTATT GATGATGAAA ATGCAACAAA ACAAACTCAA AAATATCGTG ACGCTGAACA	19620
	AAGTAAGAAA ACTGCTTATG ATCAAGCTGT AGCTGCTGCG AAAGCAATTT TAAATAAACA	19680
	AACAGGTTCA AATTCAGATA AAGCAGCAGT TGACCGTGCA TTACAACAAG TAACAAGTAC	19740
15	GAAAGATGCA TTGAATGGTG ATGCAAAACT GGCAGAAGCG AAAGCGGCAG CTAAACAAAA	19800
	CTTAGGCACT TTAAACCATA TTACGAATGC ACAACGTACT GACTTAGAAG GCCAAATCAA	19860
20	TCAAGCGACG ACTGTTGATG GCGTTAATAC TGTAAAAACA AATGCCAATA CATTAGACGG	19920
	CGCAATGAAT AGCTTACAAG GTTCAATCAA TGATAAAGAT GCGACATTAA GAAATCAAAA	19980
	TTATCTTGAT GCGGATGAAT CAAAACGAAA TGCATATACG CAAGCTGTCA CAGCGGCTGA	20040
25	AGGCATTTTA AATAAACAAA CTGGTGGTAA CACATCTAAA GCAGACGTTG ATAATGCATT	20100
	AAATGCAGTT ACAAGAGCGA AAGcGgCTTT AAATGGTGCT GACAACTTAA GAAATGCGAA	20160
	AACTTCAGCA ACAATACGA TTGATGGTTT ACCTAACTTA ACACAATTAC AAAAAGACAA	20220
30	CTTGAAGCAT CAAGTTGAaC AAGCGCAAAA TGTCAGCAGT GTAAATGGTG TTAAAGATAA	20280
	AGGTAATACG TTAAATACTG CCATGGGTGC ATTACGTACA AGTATCCAAA ATGATAATAC	20340
	GACGAAAACA AGTCAAAATT ATCTTGATGC ATCTGACAGC AACAAAAATA ATTACAATAC	20400
35	TGCTGTAAAT AATGCAAAATG GTGTTATTAA TGCAACGAAC AATCCAAATA TGGATGCTAA	20460
	TGCGATTAAAT GGCATGGCAA ATCAAGTCAA TACAACAAAA GCAGCGTTAA ATGGTGCACA	20520
	AAACTTAGCT CAAGCTAAAA CAAATGCGAC GAACACAATT AACAAACGCAC ATGACTTAAA	20580
40	CCAAAAACAA AAAGATGCAT TAAAAACACA AGTTAACAAT GCACAACGTG TATcTGATGC	20640
	AAATAACGTT CAACACACTG CAACTGAATT GAACAGTGCG ATGACAGCAC TTAAAGCAGC	20700
45	TATTGCTGAT AAAGAAAGAA CAAAAGCAAG CGGTAATTAT GTCAATGCTG ATCAAGAAAA	20760
	ACGTCAAGCG TATGATTCAA AAGTGACTAA CGCTGAAAAT ATCATTAGTG GTACACCGAA	20820
	TGCGACATTA ACAGTCAATG ACGTAAATAG TGCGGCATCA CAAGTCAATG CGGCTAAAAC	20880
50	AGCATTAAAT GGTGATAACA ACTTACGTGT AGCGAAAGAG CATGCCAACA ATACAATTGA	20940
	CGGCTTAGCA CAATTGAATA ATGCACAAAA AGCAAAATTA AAAGAACAAG TTCAAAGTGC	21000

55

EP 0 786 519 A2

	GAAAGGCTTA AGAGATAGTA TTGCGAATGA AGCAACAATT AAAGCAGGTC AAAACTACAC	21120
	TGACGCAAGT CCAAATAATC GTAACGAGTA CGACAGTGCA GTTACTGCAG CAAAAGCAAT	21180
5	CATTAATCAA ACATCGAACC CAACGATGGA ACCAAATACT ATTACGCAAG TAACATCACA	21240
	AGTGACAACCT AAAGAACAGG CATTAAATGG TGC GCGAAAC TTAGCTCAAG CTAAGACAAC	21300
	TGCGAAAAAC AACTTGAATA ACTTAACATC AATTAACAAT GCACAAAAAG ATGCGTTAAC	21360
10	GCGTAGcATT GATGGTGCAA CAACAGTAGC TGGTGTAAT CAAGAACTG CAAAAGCAAC	21420
	AGAATTAAAT AACGCAATGC ATAGTTTACA AAATGGTATC AATGATGAGA CACAAACAA	21480
	ACAACTCAG AAATACCTAG ATGCAGAGCC AAGTAAGAAA TCAGCTTATG ATCAAGCAGT	21540
15	AAATGCAGCG AAAGCAATTT TAACAAAAGC TAGTGGTCAA AATGTAGACA AAGCAGCAGT	21600
	TGAACAAGCA TTGCAAAATG TGAACAGTAC GAAGACGGCG TTGAACGGTG ATGCGAAATT	21660
	AAATGAAGCT AAAGCAGCTG CGAAACAAAC GTTAGGTACA TTAACACACA TTAATAATGC	21720
20	ACAACGTACA GCGTTAGACA ATGAAATTAC ACAAGCAACA AATGTTGAAG GTGTTAATAC	21780
	AGTTAAAGCC AAAGCGCAAC AATTAGATGG TGCTATGGGT CAATTAGAAA CATCAATTCG	21840
25	TGATAAAGAC ACGACGTTAC AAAGTCAAAA TTATCAAGAT GCTGATGATG CTAAACGAAC	21900
	TGCTTATTCT CAAGCAGTAA ATGCAGCAGC AACTATTTTA AATAAAACAg CTGGCGGTAA	21960
	TACACCTAAA GCAGATGTTG AAAGAGCAAT GCAAGCTGTT ACACAAGCAA ATACTGcATT	22020
30	AAACGGTATT CamAACTTAG ATCGTGCGAA ACArGCTGCT AACACAGCGA TTACAAATGC	22080
	TTCGGACTTA AATACAAAAC mAAAAGAAGC ATTAAAgCA CAAGTAACAA GTGCAGGACG	22140
	TGTATCTGCA GCAAATGGTG TTGAACATAC TGCGACTGAA TTAAATACTG CGATGACAGC	22200
35	TTTAAAGCGT GCCATTGCTG ATAAAGCTGA GACAAAAGCT AGTGGTAACT ATGTCAATGC	22260
	TGATGCGAAT AAACGTCAAG CATATGATGA AAAAGTTACA GCTGCCGAAA ATATCGTTAG	22320
	TGGTACACCA ACACCAACGT TAACACCAGC AGATGTTACA AATGCAGCAA CGCAAGTAAC	22380
40	GAATGCTAAG ACGCAGTTAA ACGGTAATCA TAATTTAGAA GTAGCGAAAC AAAATGCTAA	22440
	CACTGCAATT GATGGTTTAA CTTCTTTAAA TGGTCCGCAA AAAGCAAAAC TTAAAGAAC	22500
45	AGTGGGTCAA GCGACGACGT TGCCAAATGT TCAAACTGTT CGTGATAATG CACAAACATT	22560
	AAACACTGCA ATGAAAGGTC TACGAGATAG CATTGCGAAT GAAGCAACGA TTAAAGCAGG	22620
	TCAAACTAC ACAGATGCAA GTCAAAACAA ACAAAGTAC TACAACAGTG CAGTCACTGC	22680
50	AGCAAAAGCA ATCATTGGTC AAACAACTAG TCCATCAATG AATGCGCAAG AAATTAATCA	22740
	AGCGAAAGAC CAAGTGACAG CTAAACAACA AGCGTTAAAC GGTCAAGAAA ACTTAAGAAC	22800

55

EP 0 786 519 A2

	AGATGCAGTG AAACGTCAAA TCGAAGGTGC AACGCATGTT AATGAAGTAA CACAAGCACA	22920
	AAATAATGCG GATGCATTAA ATACAGCTAT GACGAACTTG AAAAATGGTA TTCAAGATCA	22980
5	GAATACGATT AAGCAAGGTG TTAACCTTAC TGATGCCGAC GAAGCGAAAC GTAATGCATA	23040
	TACAAATGCA GTGACGCAAG CTGAACAAAT TTAAATAAAA GCACAAGGTC CAAATACTTC	23100
	AAAAGACGGT GTCGAACTG CGTTAGAAA TGTACAACGT GCTAAAAACG AATTGAACGG	23160
10	TAATCAAAAT GTTGCGAAG CTAAGACAAC TGCGAAAAAT GCATTGAATA ACCTAACATC	23220
	AATTAATAAT GCACAAAAAG AAGCATTGAA ATCACAATT GAAGGTGCGA CAACAGTTGC	23280
	AGGTGTAAAT CAAGTGTCTA CAACGGCATC TGAATTAAAT ACAGCAATGA GCAACTTACA	23340
15	AAATGGTATT AATGATGAAG CAGCTACAAA AGCAGCGCTT AATGGTACTC AAAACCTTGA	23400
	AAAAGCTAAA CAACACGCAA ATACAGCAAT TGACGGTTTA AGCCATTTAA CAAATGCACA	23460
20	AAAAGAGGCA TTAAAACAAT TGGTACAACA ATCGACTACT GTTGCAGAAG CACAAGGTAA	23520
	TGAGCAAAAA GCAAACAATG TTGATGCAGC AATGGACAAA TTACGTCAA GTATTGCAGA	23580
	TAATGCGACA ACAAACAAA ACCAAAATTA TACTGATGCA AGTCAGAATA AAAAGGATGC	23640
25	GTACAATAAT GCTGTCACAA CTGCACAAGG TATTATTGAT CAACTACAA GTCCAACCTT	23700
	AGATCCGACT GTTATCAATC AAGCTGCTGG ACAAGTAAGC ACAACTAAAA ATGCATTAAA	23760
	TGGTAATGAA AACCTAGAGG CAGCGAAACA ACAAGCGTCA CAATCATTAG GTTCATTAGA	23820
30	TAACCTAAAT AATGCGCAA AACAAACAGT TACTGATCAA ATTAATGGCG CGCATACTGT	23880
	TGATGAAGCA AATCAAATTA AGCAAAATGC GCAAACTTA AATACAGCGA TGGGTAACCT	23940
	GAAACAAGCG ATAGCTGACA AAGATGCTAC GAAAGCGACA GTTAACCTCA CTGATGCAGA	24000
35	TCAAGCAAAA CAACAAGCAT ATAACACTGC TGTACAAAT GCTGAAAATA TCATTTCAA	24060
	AGCTAATGGC GGCAATGCAA CACAAGCTGA AGTTGAACAA GCAATCAAAC AAGTTAATGC	24120
	TGCAAAACAA GCATTAAATG GTAATGCCAA CGTTCAACAT GCAAAAGACG AAGCAACAGC	24180
40	ATTAATTAAT AGCTCTAATG ACCTTAACCA AGCACAAAA GACGCATTAA AACAACAAGT	24240
	TCAAAATGCA ACTACTGTAG CTGGTGTAAT CAATGTTAAA CAAACAGCAC AAGAGTTAAA	24300
45	CAATGCTATG ACACAATTAA AACAAGGCAT TGCAGATAAA GAACAAACAA AAGCTGATGG	24360
	TAACCTTGTC AATGCAGATC CTGATAAGCA AAATGCATAT AATCAAGCAG TAGCGAAAGC	24420
	TGAAGCATT AATTAGTGCTA CGCCTGATGT TGTCGTTACA CCTAGCGAAA TTAGTGCAGC	24480
50	GTAAATAAAA GTTACGCAAG CTAAAAATGA TTAAATGGT AATACAACT TAGCAACGGC	24540
	GAAACAAAAT GTTCAACATG CTATTGATCA ATTGCCAAAC TTAAACCAAG CGCAACGTGA	24600

55

EP 0 786 519 A2

	AGCGGCGACA ACGCTTAATG ACGCGATGAC ACAATTGAAA CAAGGTATTG CGAATAAAGC	24720
	ACAAATTAAA GGTAGCGAGA ACTATCACGA TGCTGATACT GACAAGCAAA CAGCATATGA	24780
5	TAATGCACTA ACAAAGCAG AAGAATTGTT AAAACAAACA ACAAATCCAA CAATGGATCC	24840
	AAATACAATT CAACAAGCAT TAACTAAAGT GAATGACACA AATCAAGCAC TTAACGGTAA	24900
	TCAAAAATTA GCTGATGCCA AACAAAGATGC TAAGACAACA CTTGGTACAC TAGATCATT	24960
10	AAATGATGCT CAAAAACAAG CGCTAACAAC TCAAGTTGAA CAAGCACCAG ATATTGCAAC	25020
	AGTTAATAAT GTTAAGCAAA ATGCTCAAAA TCTGAATAAT GCTATGACTA ACTTAAACAA	25080
	TGCATTACAA GATAAACTG AGACATTAAA TAGCATTAACT TTTACTGATG CAGATCAAGC	25140
15	TAAGAAAGAT GCTTATACTA ATGCGGTTTC ACATGCAGAA GGTATTTTAT CTAAAGCAAA	25200
	TGGCAGCAAT GCAAGTCAAA CTGAAGTGA ACAAGCGATG CAACGTGTGA ACGAAGCGAA	25260
20	ACAAGCATTG AATGGTAATG ACAATGTACA ACGTGCAAAA GATGCAGCGA AACAAAGTAT	25320
	TACAAATGCA AATGATTTAA ATCAAGCAAT GACACAATTG AAACAAGGTA TTGCAGATAA	25380
	AGACCAACT AAAGCAAATG GTAACTTTGT CAATGCTGAT ACTGATAAGC AAAATGCTTA	25440
25	CAACAATGCG GTAGCACATG CTGAACAAAT AATTAGTGGT ACACCAAATG CAAACGTGGA	25500
	TCCACAACAA GTGGCTCAAG CGTTACAACA AGTGAATCaA GCTAAGGGTG ATTTAAACGG	25560
	TAACCATAAC TTACAAGTTG CTAAAGACAA TGCAAATACA GCCATTGATC AGTTACCAAA	25620
30	CTTAAATCAA CCACAAAAA CAGCATTAAA AGACCAAGTG TCGCATGCAG AACTTGTTAC	25680
	AGGTGTTAAT GCTATTAAGC AAAATGCTGA TCGGTAAAT AATGcAATGG GTACATTGAA	25740
	ACAACAAATT CAAGCGAACA GTCAAGTACC ACAGTCAGTT GACTTTACAC AAGCGGATCA	25800
35	AGACAAACAA CAAGCATATA ACAATGCGGC TAACCAAGCG CAACAAATCG CAAATGGCAT	25860
	ACCAACACCT GTATTGACGC CTGATACAGT AACACAAGCA GTGACAACCTA TGAATCAAGC	25920
	GAAAGATGCA TTAAACGGTG ATGAAAAATT AGCACAAGCG AAACAAGAAG CTTTAGCAAA	25980
40	TCTTGATACG TTACGCGATT TAAATCAACC ACAACGTGAT GCATTACGTA ACCAAATCAA	26040
	TCAAGCACAA GCGTTAGCTA CAGTTGAACA AACTAAACAA AATGCACAAA ATGTGAATAC	26100
45	aGCaATGAGT AACTTGAAAC aAGGTATTGC aAACAAAGAT ACTGTCAAAG CAAGTGAGAA	26160
	CTATCATGAT GCTGATGCCG ATAAGCAAAC AGCATATACA AATGCAGTGT CTCAAGCGGA	26220
	AGGTATTATC AATCAAACGA CAAATCCAAC GCTTAACCCA GATGAAATAA CACGTGCATT	26280
50	AACTCAAGTG ACTGATGCTA AAAATGGCTT AAACGGTGAA GCTAAATTGG CAACTGAAAA	26340
	GCAAAATGCT AAAGATGCCG TAAGTGGGAT GACGCATTTA AACGATGCTC AAAAACAAGC	26400

55

EP 0 786 519 A2

	AGCAACGAGC	CTAGATCAAG	CAATGGATCA	ATTATCACAA	GCTATTAATG	ATAAAGCTCA	26520
	AACATTAGCG	GACGGTAATT	ACTTAAATGC	AGATCCTGAC	AAACAAAATG	CGTATAAACA	26580
5	GGCAGTAGCA	AAAGCTGAAG	CATTATTGAA	TAAACAAAGT	GGTACTAATG	AAGTACAAGC	26640
	ACAAGTTGAA	AGCATCACTA	ATGAAGTGAA	CGCAGCGAAA	CAAGCATTAA	ATGGTAATGA	26700
	CAATTTGGCA	AATGCAAAAC	AACAAGCAAA	ACAACAATTG	GCGAACTTAA	CACACTTAAA	26760
10	TGATGCACAA	AAACAATCAT	TTGAAAGTCA	AATTACACAA	GCGCCACTTG	TTACAGATGT	26820
	CACTACGATT	AATCAAAAAG	CACAAACGTT	AGATCATGCG	ATGGAATTAT	TAAGAAATAG	26880
	TGTTGCGGAT	AATCAAACGA	CATTAGCGTC	TGAAGATTAT	CATGATGCAA	CTGCGCAAAG	26940
15	ACAAAATGAC	TATAACCAAG	CTGTAACAGC	TGCTAATAAT	ATAATTAATC	AAACTACATC	27000
	GCCTACGATG	AATCCAGATG	ATGTTAATGG	TGCAACGACA	CAAGTGAATA	ATACGAAAGT	27060
20	TGCATTAGAT	GGTGATGAAA	ACCTTGCAGC	AGCTAAACAA	CAAGCAAACA	ACAGACTTGA	27120
	TCAATTAGAT	CATTTGAATA	ATGCGCAAAA	GCAACAGTTA	CAATCACAAA	TTACGCAATC	27180
	ATCTGATATT	GCTGCAGTTA	ATGGTCACAA	ACAAACAGCA	GAATCTTTAA	ATACTGCGAT	27240
25	GGGTAACCTA	ATTAATGCGA	TTGCAGATCA	TCAAGCCGTT	GAACAACGTG	GTAAC TTCAT	27300
	CAATGCTGAT	ACTGATAAAC	AAACTGCTTA	TAATACAGCG	GTAAATGAAG	CAGCAGCAAT	27360
	GATTAACAAA	CAAAC TGTC	AAAATGCGAA	CCAAACAGAA	GTAGAACAAG	CTATTACTAA	27420
30	AGTTCAAACA	ACACTTCAAG	CGTTAAATGG	AGACCATAAT	TTACAAGTTG	CTAAAACAAA	27480
	TGCGACGCAA	GCAATTGATG	CTTTAACAAG	CTTAAATGAT	CCTCAAAAAA	CAGCATTAAA	27540
	AGACCAAGTT	ACAGCTGCAA	CTTTAGTAAC	TGCAGTTCAT	CAAATTGAAC	AAAATGCGAA	27600
35	TACGCTTAAC	CAAGCAATGC	ATGGTTTAAG	ACAGAGCATT	CAAGATAACG	CAGCAACTAA	27660
	AGCAATATAGC	AAATATATCA	ACGAAGATCA	ACCAGAGCAA	CAAAACTATG	ATCAAGCTGT	27720
	TCAAGCCGCA	AATAATATTA	TCAATGAACA	AACTGCAACA	TTAGATAATA	ATGCGATTAA	27780
40	TCAAGCAGCG	ACAACTGTGA	ATACAACGAA	AGCAGCATT	CATGGTGATG	TGAAGTTACA	27840
	AAATGATAAA	GATCATGCTA	AGCAAACGGT	TAGTCAATTA	GCACATCTAA	ACAATGCACA	27900
45	AAAACATATG	GAAGATACGT	TAATTGATAG	TGAAACAAC	AGAACAGCAG	TTAAGCAAGA	27960
	TTTGA CTGAA	GCACAAGCAT	TAGATCAACT	TATGGATGCA	TTACAACAAA	GTATTGCTGA	28020
	CAAAGATGCA	ACACGTGCGA	GCAAGTGATA	TGTCAATGCA	GAACCGAATA	AAAAACAATC	28080
50	CTATGATGAA	GCAAGTTCAA	ATGCTGAGTC	TATCATTGCA	GGATTAAATA	ATCCAACAT	28140
	CAATAAAGGT	AATGTATCAA	GTGCGACTCA	AGCAGTAATA	TCATCTAAAA	ATGCATTAGA	28200

55

EP 0 786 519 A2

	TCAATTAACA CCAGCTCAAC AACAAAGCGCT AGAAAATCAA ATTAATAATG CAACAACCTCG	28320
	TGATAAAGTG GCTGAAATCA TTGCACAAGC GCAAGCATTa AATGAAGCGA TGAAAGCATT	28380
5	AAAAGAAAGT ATTAAGGATC AACCACAAAC TGAAGCAAGT AGTAAATTTA TTAACGAGGA	28440
	TCAAGCGCAA AAAGATGCTT ATACGCAAGC AGTACAACAC GCGAAAGATT TGATTAACAA	28500
	AACAACGTAT CCTACATTAG CTAAATCAAT CATTGATCAA GCGACACAGG CAGTGACAGA	28560
10	TGCTAAAAAC AATTTACATG GTGATCAAAA ACTAGCTCAA GATAAGCAAC GTGCAACAGA	28620
	AACGTTAAAT AACTTGTCTA ACTTGAATAC ACCACAACGT CAAGCACTTG AAAATCAAAT	28680
	TAATAATGCA GCAACTCGTG GCGAAGTAGC ACAAAAATTA ACTGAAGCAC AAGCACTTAA	28740
15	CCAAGCAATG GAAGCTTTAC GTAATAGCAT TCAAGATCAA CAGCAAACGG AAGCGGGTAG	28800
	CAAGTTTATC AATGAAGATA AaCCaCmAAA AGrTGCTTAC CAAGCAGCAG TTCAAAATGC	28860
	AAAAGATTTA ATTAATCAAA CTAACAATCC AACGCTTGAT AAAGCACAAG TTGAACAATT	28920
20	GACACAAGCT GTTAACCAAG CTAAAGATAA CCTACACGGT GATCAAAAAC TTGCAGACGA	28980
	TAAACAACAT GCGGTTACTG ATTTAAATCA ATTAAATGGT TTGAATAATC CGCAACGTCA	29040
25	AGCACTTGAA AGCCAAATAA ACAACGCAGC AACTCGTGGC GAAGTAGCAC AAAAATTAGC	29100
	TGAAGCAAAA GCGCTTGATC AAGCAATGCA AGCATTACGT AATAGTATTC AAGATCAACA	29160
	ACAAACAGAA TCTGGTAGCA AGTTTATCAA TGAAGATAAA CCGCAAAAAG ATGCTTACCA	29220
30	AGCAGCAGTT CAAAATGCAA AAGATTTAAT TAACCAAACA GGTAATCCAA CACTCGACAA	29280
	ATCACAAGTA GAACAATTGA CACAAGCAGT AACAACTGCA AAAGATAATC TACATGGTGA	29340
	TCAAAAACCTT GCTCGTGATC AACACAAGC AGTAACAACT GTAAATGCAT TGCCAACTT	29400
35	AAATCATGCA CAACAACAAG CATTAACTGA TGCTATAAAT GCAGCGCCTA CAAGAACAGA	29460
	GGTtGCACAA CATGTTCAA CTGCTACTGA ACTTGATCAC GCGATGGAAA CATTGAAAAA	29520
	TAAAGTTGAT CAAGTGAATA CAGATAAGGC TCAACCAAAT TAACTGAAG CGTCAACTGA	29580
40	TAAAAAAGAA GCAGTAGATC AAGCGTTACA AGCTGCAGAA AGCATTACAG ATCCAACTAA	29640
	TGGTTCAAAT GCGAATAAAG ACGCTGTAGA CCAAGTATTA ACTAAGCTTC AAGAAAAAGA	29700
45	AAATGAGTTA AATGGTAATG AGAGAGTCGC TGAAGCTAAA ACACAAGCGA AACAACTAT	29760
	TGACCAATTA ACACATTTAA ATGCTGATCA AATTGCAACT GCTAAACAAA ACATTGATCA	29820
	AGCGACGAAA CTTCAACCAA TTGCTGAATT AGTAGATCAA GCAACGCAAT TGAATCAATC	29880
50	TATGGATCAA TTACAACAAG CAGTTAATGA ACATGCTAAC GTTGAGCAAA CTGTAGATTA	29940
	CACACAAGCA GATTGAGATA AACAAAATGC TTATAAACAA GCTATTGCTG ATGCTGAAAA	30000

55

EP 0 786 519 A2

TGCAAAACAA GCATTAAATG GTGATGAACG TGTAGCACTT GCTAAAACAA ATGGTAAACA 30120
 TGACATCGAC CAATTGAATG CATTAAACAA TGCTCAACAA GATGGATTTA AAGGTCGCAT 30180
 5 CGATCAATCA AACGATTTAA ATCAAATCCA ACAAATTGTA GATGAGGCTA AGGCACTTAA 30240
 TCGTGCAATG GATCAATTGT CACAAGAAAT CACTGACAAT GAAGGACGCA CGAAAGGTAG 30300
 CACGAACTAT GTCAATGCAG ATACACAAGT CAAACAAGTA TATGATGAAA CGGTTGATAA 30360
 10 AGCGAAACAA GCACTTGATA AATCGACTGG TCAAACTTA ACTGCAAAAC AAGTTATCAA 30420
 ATTAAATGAT GCAGTCACTG CAGCTAAGAA AGCATTAAAT GGTGAAGAAA GACTTAATAA 30480
 TCGTAAAGCT GAAGCATTAC AAAGATTGGA TCAATTAACA CATCTAAACA ATGCTCAAAG 30540
 15 ACAATTAGCA ATCCAACAAA TTAATAATGC TGAAACGCTA AATAAAGCAT CTCGAGCAAT 30600
 TAATAGAGCA ACTAAATTAG ATAATGCAAT GGGTTCAGTA CAACAATATA TTGACGAACA 30660
 20 GCACCTTGGT GTTATCAGCA GCACAAATTA CATCAATGCA GATGACAATT TGAAAGCAAA 30720
 TTATGATAAT GCAATTGCGA ATGCAGCACA TGAGTTAGAT AAAGTGCAAG GTAATGCAAT 30780
 TGCaAAAGCT GAAGCAGAGC AATTGAAACA AAATATTATC GATGCTCAAA ATGCATTAAA 30840
 25 TGGAGACCAA AACCTTGCAA ATGCCAAAGA TAAAGCAAAT GCGTTTGTTA ATTCGTTAAA 30900
 TGGATTAAAT CAACAGCAAC AAGATCTTGC ACATAAAGCA ATTAACAATG CCGATACTGT 30960
 ATCAGATGTA ACAGATATTG TTAATAATCA AATTGACTTA AATGATGCAA TGGAAACATT 31020
 30 GAAACATTTA GTTGACAATG AAATTCCAAA TGCAGAGCAA ACTGTCAATT ACCAAAACGC 31080
 TGACGATAAT GCTAAA 31096

(2) INFORMATION FOR SEQ ID NO: 60:

35 (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 2243 base pairs
 . (B) TYPE: nucleic acid
 . (C) STRANDEDNESS: double
 40 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 60:

45 ATGACAGAAT GGGAGCGAGG ACTTAGAATG TTTCTAAAT CAGGTTTATT AAATTTTGAG 60
 TTAGCGATAG mAAATCGTTC ATTAAATGAT GATGAAAAAG CATTAAAATA TGTGCGTAAA 120
 GCATTAAATG CAGACCCTAA AAATACAGAT TATATTAAC TAgAAAAAGA GTTGAATAAA 180
 50 TCAAATGAGT CGAAAAATAA ATAACCTTTA TGATGTACAA CAGTTATTGA AAAGTTACGG 240
 ATTTCTAATA TATTTTAAAA ATCCAGAAGA TATGTACGAA ATGATTCAAC AGGAGATTTC 300

55

EP 0 786 519 A2

	TAATCAGAGA AGGAATGAAC AGAAATGACA AAAATTATTT TAGCAGCTGA TGTAGGCGGG	420
	ACGACTTGTA AATTAGGTAT TTTCACACCT GAATTAGAAC AATTACATAA ATGGTCTATT	480
5	CACACTGATA CATCTGATAG TACAGGATAT ACACTTTTGA AAGGAATTTA TGATTGCTTT	540
	GTTGAAAAAG TAAATGAAAA TAATTATAAT TTTTCAAATG TACTTGCGGT AGGTATTGGT	600
	GTACCAGGTC CTGTTGACTT TGAAAAAGGT ACAGTAAATG GAGCAGTAAA CTTATATTGG	660
10	CCAGAAAAAG TTAATGTACG TGAGATTTTT GAACAATTCG TTGATTGTCC AGTGTATGTA	720
	GATAATGATG CTAACATAGC TGCTTTAGGG GaGAAACACA AAGGTGCTGG TGAAGGTGCC	780
15	GATGATGTTG TTGCCATCAC ACTTGGTACA GGTCTAGGTG GAGGAATTAT TTCCAAATGG	840
	TGAAATCGTA CATGGTCATA ATGGCTCtGG CGCAGAAATA GGTcATTTTA .GAgCAGACTT	900
	CgATCAACGA TTTaAATGTA ATTGTGGTCG TTCTGGATGT ATTGAAACAG TTGCTTCaGC	960
20	GACAGGCGTT GTTAACTTAG TTAACCTCtA CTATCCGAAG TTGACGTTTA GATCTTCTAT	1020
	ATTAGAATTG ATTAAAGAAA ATAAGGTtAC aGCAAAAGCT GTTTTTGATG CGGCAAAAGC	1080
	TGGTGACCAA TTCTGTATTT TCATTACTGA AAAGGTTGCA AACTATATTG GATATTTATG	1140
25	TAGTATTATT AGTGTTACAA GTAATCCGAA ATATATCGTT CTAGGTGGAG GAATGTCTAC	1200
	TGCAGGACCT ATTTTAATTG AAAATATTAA AACAGAATAT CATAATTAA CATTGCACC	1260
	TGCTCAATTT GAAACTGAAA TTGTACAAGC GAAATTAGGT AATGATGCAG GTATTACAGG	1320
30	AGCAGCAGGA TTAATCAAGA CCTATGTATT AGATAAAGAG GGGGTAAAAT AATGGCTATT	1380
	GTTGATGTGG TTGTTATTCC AGTTGGAACG GAAGGTCCGA GTGTTAGTAA ATATATTGCA	1440
	GATATTCAGA AAAAaCTTCA AGAATATAAA GCAATGGGTA AAATTGATTT TCAATTAACA	1500
35	CCAATGAATA CTCTAATTGA AGGTGAATTA AGCGATGTAT TAGAAGTTGT GCAAGTGATA	1560
	CATGaATTAC CTTTTGATAA AGGTTTAAGT AGAGTTTGTA CAAATATCCG TATTGATGAC	1620
40	CGACGAGACA AATCTAGAAA AATGAATGAT AAActAACAT CAGTACAAAA ACATTTAGAA	1680
	AATAGTGGTG AAAACCTATG AGGATTTCaA GCTTAACTTT AGGCTTAGTT GATACTAATA	1740
	CGTATTTcAT CGAAaATGAC AAAGCTGTTA TTCTGATTGA CCCTTcAGGT GAAAGTGAAA	1800
45	AAATTATTAA AAAATTAAAC CAAATAAATA AACCGTTAAa AGCTATTTTA TTAACACATG	1860
	CACACTTTGA TCATATCGGA GCAGTCGATG ATATAGTTGA TCGATTcGAT GTCCCGGTTT	1920
	ATATGCATGA AGCAGAGTTT GATTTTCTAA AAGATCCCGT TAAAAATGGG GCAGATAAAT	1980
50	TTAAGCAATA TGGATTACCA ATTATTACAA GTAAGGTaAC TCCTGAAAAG .TTAAmCGAAG	2040
	GTAGCACAGA AATAGAAGGA TTTAAGTTnT nAyrTGtaCA CACACCTGGA CATTcACCAG	2100

55

GAATCGGACG TACAGATTTA TATAAAGGTG ATTATGAAAC GCTAGTTGAT TCTATTCAAG 2220
 ATAAAATATT TGAATTAGAA GGC 2243

5 (2) INFORMATION FOR SEQ ID NO: 61:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 8009 base pairs
 (B) TYPE: nucleic acid
 10 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 61:

15 TTGGnATCAT tyAcgGTAAA AAGAATAAaG CAAGATTtAT TTCATTAGTA CTAATTTGTG 60
 CAATGTTTGC AATTIGTTGG GTTGCATATA TTCAATGGGA GTCTACAATC GCTTCATTTA 120
 20 CACAATCTAT TAATATTTCa ATGGCACAAT ATAGTGT TTTT ATGGACAATT AACGGAATAA 180
 TGATTTTAGT AGCACAACCA TTAATTAAAC CGATTCTCTA TCTGT TAAAA GGAAACTTAA 240
 AGAAGCAAAT GTTGTCTGGC ATCATCATTT TTATGTTGTC GTTCTTTGTC ACGAGTTTTG 300
 25 CCGAAAACCT TACAATATTT GTTGTCTGGTA TGATTATTTT AACTTTTGGGA GAAATGTTTG 360
 TATGGCCAGC AGTTCCAAC TATAGCCAATC AGTTAGCGCC AGATGGTAAG CAAGGACAGT 420
 ACCAAGGTTT TGTGAATTCA GCTGCTACAG TAGGAAAAGC ATTTGGTCCA TTTCTTGGTG 480
 30 GTGTATTAGT TGATGCGTTT AATATGCGCA TGATGTTTAT CGGTATGATG CTACTACTTG 540
 TATTTGCATT AATATTATTA ATGGTTTTCa AGGAGAATAA TACGCAACCT AAAAAAATAG 600
 ATGCATAATG AGTAAATAGA ATTAACGTTA TAGACTTGAA ATAAATGTCT TTATAACATA 660
 35 ATATTAATTT GTATAATTTA ATTTCTGTTG GAGCTTTTCT ACAGAAAGCT AGTGATGCTG 720
 AGAGCTAGTG TTAAGGACTA AATGTAAATC GTATTAATTT TAAATTGAAT GAATGACATC 780
 TCTTACTATT AAAATGAGTG CACAATTTTT GTGAAATAGG GTGGTAACGC GGCAAATGTC 840
 40 GTCCCTATGT AAATAGAATA GTTAGAGGTG TCTTTTTTAT TGAATAGGAG GAAATGTGTT 900
 GAATTACAAC CACAATCAAA TTGAAAAGAA ATGGcAAGAC TATTGGGACG AAAATAAAAC 960
 45 ATTTAAAACA AATGATAACT TAGGTCAAAA GAAATTTTAT GCTTTAGACA TGTTTCCATA 1020
 TCCATCAGGT GCTGGTTTAC ATGTTGGACA TCCTGAGGGc TATACAGCAA CAGATATCAT 1080
 TTCAAGATAT AAAAGAATGC AAGGATATAA TGTATTACAT CCGATGGGGT GGGATGCATT 1140
 50 CGGATTACCA GCAGAGCAAT ATGCTTTAGA CACTGGCAAC GACCCACGTG AATTTACAAA 1200
 GAAAAATATC CAAACTTTTA AACGACAAAT TAAAGAATTA GGGTTCAGTT ATGATTGGGA 1260

55

EP 0 786 519 A2

GTTATATAAC AAAGGTTTAG CATACGTTGA TGAAGTTGCA GTTAACTGGT GTCCAGCATT 1380
 AGGCACTGTT TTATCTAACG AAGAAGTGAT TGATGGTGTC TCTGAACGTG GTGGACATCC 1440
 5 AGTTTATCGT AAGCCGATGA AACAATGGGT ACTTAAATC ACAGAATATG CAGATCAATT 1500
 ATTAGCAGAT TTAGATGATT TAGATTGGCC TGAGTCTTTA AAAGATATGC AGCGCAATTG 1560
 GATTGGACGT TCTGAAGGGG CCAAAGTTTC ATTTGATGTA GATAATACGG AAGGAAAAGT 1620
 10 AGAAGTATTT ACGACTAGAC CAGATACAAT CTATGGTGCA TCATTCTTAG TCTTAAGTCC 1680
 TGAACATGCA TTAGTTAATT CAATTACAAC AGATGAATAT AAAGAAAAAG TAAAAGCTTA 1740
 TCAAACAGAA GCTTCTAAAA AGTCAGATTT AGAACGTACA GATTTAGCAA AAGATAAATC 1800
 15 AGGTGTATTT ACTGGTGCAT ATGCAACTAA TCCTTTATCT GGTGAAAAAG TACAAATTTG 1860
 GATTGCTGAT TATGTATTAT CAACATATGG TACTGGAGCA ATTATGGCAG TACCAGCGCA 1920
 20 TGATGACAGA GATTATGAAT TTGCTAAAAA GTTTGATTTG CCAATCATTG AAGTCATCGA 1980
 AGGTGGAAAT GTTGAAGAAG CAGCATACAC TGGTGAAGGT AAACATATTA ATTCTGGTGA 2040
 ACTTGATGGT TTAGAAAAATG AAGCGGCAAT TACTAAAGCT ATTCAATTAT TAGAGCAAAA 2100
 25 AGGTGCTGGC GAAAAGAAAG TTAATTACAA ATTAAGAGAT TGGTTATTCA GTCGTCAGCG 2160
 TTATTGGGGC GAACCAATTC CTGTCATTCA TTGGGAAGAT GGAACAATGA CAACTGTTCC 2220
 TGAAGAAGAG CTACCATTGT TGTTACCTGA AACAGATGAA ATCAAGCCAT CAGGGACTGG 2280
 30 TGAGTCTCCA CTAGCTAATA TTGATTCATT TGTAATGTT GTAGATGAAA AAACAGGTAT 2340
 GAAAGGACGT CGTGAAACAA ATACAATGCC ACAATGGGCA GGTAGTTGTT GGTATTATTT 2400
 ACGTTACATC GATCCTAAAA ATGAAAATAT GTTAGCAGAT CCTGAAAAAT TAAAACATTG 2460
 35 GTTACCTGTT GATTATATATA TCGGTGGAGT AGAACATGCG GTTCTTCACT TATTATATGC 2520
 AAGATTTTGG CATAAAGTCC TTTATGATTT GGCTATCGTA CCTACTAAAG AACCTTTCCA 2580
 AAAATTATTT AACCAAGGTA TGATTTTAGG AGAAGGTAAT GAGAAGATGA GTAAATCTAA 2640
 40 AGGAAATGTA ATCAATCCTG ATGATATAGT ACAGTCTCAT GGTGCAGATA CTTTGCCTCT 2700
 TTACGAAATG TTTATGGGAC CTTTAGATGC TGCAATTGCA TGGAGTGAAA AAGGATTAGA 2760
 45 TGGGTCTCGT CGATTCTTAG ATCGCGTATG GCGTTTAATG GTAAATGAAG ATGGGACATT 2820
 GAGTTCAAAA ATTGTAAC TAATAATAA ATCTTTAGAT AAAGTTTATA ACCAACTGT 2880
 TAAAAAGGTA ACAGAAGACT TTGAAACATT AGGATTTAAT ACTGCTATTA GTCAATTAAT 2940
 50 GGTATTTATT AATGAGTGTT ATAAAGTTGA TGAAGTTTAT AAACCTTACA TTGAAGGCTT 3000
 CGTTAAAAATG TTAGCACCTA TTGCACCACA TATCGGTGAA GAATTATGGT CAAAATTAGG 3060

55

EP 0 786 519 A2

	TGATGAAGTA GAAATCGTTG TTCAAGTGAA TGGTAAATTG AGAGCTAAAA TTAAAAATTGC	3180
	TAAAGATACA TCAAAAGAAG AAATGCAAGA AATTGCCTTA TCTAATGACA ATGTTAAAGC	3240
5	GAGTATTGAA GGTAAAGACA TCATGAAAGT CATCGCTGTT CCTCAAAAAT TAGTCAATAT	3300
	TGTAGCTAAA TAATGTTTTA AGGAGGACTT TGAAATGAAG TCAATTACTA CAGATGAATT	3360
	AAAAAATAAA CTTTTAGAAT CTAAACCAGT TCAAATTGTT GATGTTTCGT CTGATGAAGA	3420
10	AACAGCAATG GGATATATTC CTAATGCAAA GTTAATTCCA ATGGATACCA TTCCGGATAA	3480
	TTTAAATTCA TTTAATAAAA ATGAAATATA TTATATTGTA TGTGCTGGTG GAGTTCGAAG	3540
	CGCTAAAGTT GTAGAATATT TAGAGGCAAA TGGCATTGAT GCCGTAAATG TCGAAGGCGG	3600
15	CATGCACGCA TGGGGCGATG AAGGTTTGGG AATAAAAAGT ATTTAAAGTA GTGACATAAT	3660
	TTAAAATAAT ATTACATTG TAATGACACC AAGTAACGTT TCGGTTGCTT GGTGTTTTTT	3720
20	GGTATGAATT ACTTTCTGTT ACAAACAAT CTAAAGCGTT CTTGTTATGT TTTATTAAGA	3780
	TTTTAATTAC AAAACGGAAA CTAAATTGTA ATAAAATAAA ACTTTATTTT ATAAAATGAT	3840
	GATGATAAAA TTGAGTGAAC TTAAATATT GTACAAAATA ATATAGCTAT AAATATAATA	3900
25	TAGCTATAAA TATAATATGA GGGAGCGTAT ATTTTtagCA TAATTCTTAA CAACACAGCA	3960
	GAGAACAGAC AACCAGGAGG AAAATGAAAT GAATTTGTTA AAGAAAAATA AATATAGTAT	4020
	TAGGAAGTAT AAAGTAGGCA TATTCTCTAC TTTAATCGGA ACAGTTTTAT TACTTTCAAA	4080
30	CCCAAATGGT GCACAAGCCT TAACTACGGA TAATAATGTA CAAAGCGATA CTAATCAAGC	4140
	AACACCTGTA AATTCACAAG ATAAAGATGT TGCTAATAAT AGAGGTTTAG CAAATAGTGC	4200
	GCAGAATACA CCTAATCAAT CTGCAACAAC CAATCAAGCA ACGAATCAAG CATTGGTTAA	4260
35	TCATAATAAT GGTAGTATAG TAAATCAAGC TACGCCAACA TCAGTGCAAT CAAGTACGCC	4320
	TTCAACACAA AACAATAATC ATACAGATGG CAATACAACA GCAACTGAGA CAGTGTCAAA	4380
	CGCTAATAAT AATGATGTAG TGTCGAATAA TACCGCATT AATGTACCAA CTAAAACAAA	4440
40	TGAAAATGGT TCAGGAGGAC ATCTAACTTT AAAGGAAATT CAAGAAGATG TTCGTCATTC	4500
	TTCAAATAAA CCAGAGCTAG TTGCAATTGC TGAACCAGCA TCTAATAGAC CGAAAAAGAG	4560
45	AAGTAGACGT GCGGCACCGG CAGATCCTAA TGCAACTCCA GCAGATCCAG CGGCTGCAGC	4620
	GGTAGGAAAC GGTGGTGAC CAGTTGCAAT TACAGCGCCA TATACGCCAA CAACTGATCC	4680
	TAATGCCAAT AATGCAGGAC AAAATGCACC TAACGAAGTG CTGTCATTG ATGACAATGG	4740
50	TATTAGACCA AGTACCAACC GTTCTGTGCC AACAGTAAAC GTTGTTAATA ACTTGCCGGG	4800
	CTTCACACTA ATCAATGGTG GCAAAGTAGG GGTGTTTAGT CATGCAATGG TAAGAACGAG	4860

55

EP 0 786 519 A2

	TCGTATACAT GGAAGTACATA CGAATGACCA TGGCGATTTT AATGGTATCG AGAAAGCATT	4980
	AACAGTAAAT CCGAATTCTG AATTAATCTT TGAATTTAAT ACAATGACTA CTAAAAACGG	5040
5	TCAAGGCGCA ACAAATGTTA TTATCAAAAA TGCTGATACT AATGATACGA TTGCTGAAAA	5100
	GACTGTTGAA GGCGGTCCAA CTTTGCCTTT ATTTAAAGTA CCTGATAATG TGAGAAATCT	5160
	CAAAATTCAA TTTGTACCTA AAAATGACGC AATAACAGAT GCGCGTGGCA TTTATCAACT	5220
10	AAAAGATGGT TACAAATACT ATAGCTTTGT TGACTCTATC GGACTTCATT CTGGGTCACA	5280
	TGTTTTTGTT GAAAGACGAA CAATGGATCC AACAGCAACA AATAATAAAG AGTTTACTGT	5340
	AACAACATCA TTAAAGAATA ATGGTAATTC TGGTGCTTCT CTAGATACAA ATGACTTTGT	5400
15	ATATCAAGTT CAATTACCTG AAGGTGTTGA ATATGTGAAC AATTCATTGA CTAAAGATTT	5460
	TCCAAGTAAC AATTCAGGCG TTGATGTTAA TGATATGAAT GTTACATATG ATGCAGCAAA	5520
20	TCGTGTGATA ACAATTAAAA GTACTGGAGG AGGTACAGCA AACTCTCCGG CACGACTTAT	5580
	GCCTGATAAA ATACTCGATT TAAGATATAA ATTACGTGTA AATAATGTGC CGACACCAAG	5640
	AACAGTAACA TTTAACGAGA CATTAACGTA TAAAACATAT ACACAAGATT TCATTAATTC	5700
25	AGCTGCAGAA AGTCATACTG TAAGTACAAA TCCATATACT ATCGATATCA TCATGAATAA	5760
	AGATGCATTA CAAGCCGAAG TTGACAGACG TATTCAACAA GCTGATTATA CATTTGCGTC	5820
	ATTAGATATC TTTAATGGTC TGAAACGACG CGCACAAACG ATTTTAGATG AAAATCGTAA	5880
30	CAATGTACCA TTAAATAAAA GAGTTTCTCA AGCATATATT GATTCATTAA CTAATCAAAT	5940
	GCAACATACG TTAATTCGAA GTGTTGATGC TGAAATGCA GTTAATAAAA AAGTTGACCA	6000
	AATGGAAGAT TTAGTTAATC AAAATGATGA ATTGACAGAT GAAGAAAAAC AAGCAGCAAT	6060
35	ACAAGTTATC GAGGAACATA AAAATGAAAT AATTGGTAAT ATTGGTGACC AAACGACTGA	6120
	TGATGGCGTT ACTAGAATCA AAGATCAAGG TATACAGACC TTAAGTGGGG ATACTGCAAC	6180
	ACCGGTTGTT AAACCAAATG CTAAAAAGC AATACGTGAT AAAGCAACGA AACAAAGGGA	6240
40	AATTATCAAT GCAACACCAG ATGCTACTGA AGACGAGATT CAAGATGCAC TAAATCAATT	6300
	AGCTACGGAT GAAACAGATG CTATTGATAA TGTTACGAAT GCTACTACAA ATGCTGACGT	6360
45	TGAAACAGCT AAAAATAATG GCATCAATAC TATTGGAGCA GTTGTTCTCTC AAGTAACTCA	6420
	TAAAAAGCT GCAAGAGATG CAATTAACCA AGCAACAGCA ACGAAAAGAC AACAAATAAA	6480
	TAGTAATAGA GAAGCAACTC AGGAAGAGAA AAATGCAGCA TTGAACGAAT TAACTCAAGC	6540
50	AACCAACCAT GCTTTAGAAC AAATCAATCA AGCAACAACA AATGCTAATG TTGATAACGC	6600
	CAAAGGAGAT GGTCTAAATG CCATTAATCC AATTGCTCCT GTAAGTGTG TTAAGCAAGC	6660

55

EP 0 786 519 A2

5
 10
 15
 20
 25
 30
 35
 40

TGATGCGACT CAAGAAGAAA GACAAGCAGC AATTGACAAA GTGAATGCTG CTGTAACTGC 6780
 AGCAAACACA AACATTTTAA ACGCTAATAC CAATGCTGAT GTTGAACAAG TAAAGACAAA 6840
 TGCATTCAA GGAATACAAG CAATTACACC AGCTACAAAA GTAAAAACAG ATGCAAAAAA 6900
 TGCCATCGAT AAAAGTGCGG AAACGCAACA TAATACGATA TTTAATAATA ATGATGCGAC 6960
 GCTCGAAGAA CAACAAGCAG CACAACAATT ACTTGATCAA GCTGTAGCCA CAGCGAAGCA 7020
 AAATATTAAT GCAGCAGATA CGAATCAAGA AGTTGCACAA GCAAAAGATC AGGGCACACA 7080
 AAATATAGTA GTGATTCAAC CGGCAACACA AGTTAAAACG GATACTCGCA ATGTTGTAAA 7140
 TGATAAAGCG CGAGAGGCGA TAACAAATAT CAATGCTACA ACTGGCGCGA CTCGAGAAGA 7200
 GAAACAAGAA GCGATAAATC GTGTCAATAC ACTTAAAAAT AGAGCATTAA CTGATATTGG 7260
 TGTGACGCT ACTACTGCGA TGGTCAATAG TATTAGAGAC GATGCAGTCA ATCAAATCGG 7320
 CGCAGTTCAA CCGCATGTAA CGAAGAAACA AACTGCTACA GGTGTATTAA ATGATTTAGC 7380
 AACTGCTAAA AAGCAAGAAA TTAATCAAAA CACAAATGCA ACAACTGAAG AAAAGCAAGT 7440
 GGCTTTAAAT CAAGTGGATC AAGAGTTAGC AACGGCAATT AATMATATAA ATCAAGCTGA 7500
 TACAAATGCG GAAGTAGATC AAGCGCAACA ATTAGGTACA AAAGCAATTA ATGCGATTCA 7560
 GCCAAATATT GTTAAAAAAC CTGCAGCATT AGCACAAATC AATCAGCATT ATAATGCTAA 7620
 ATTAGCTGAA ATCAATGCTA CACCAGATGC AACGAATGAT GAGAAAAATG CTGCGATCAA 7680
 TACTTTAAAT CAAGACAGAC AACAAGCTAT TGAAAGTATT AAACAAGCTA ACACAAATGC 7740
 AGAAGTAGAC CAAGCTGCGA CAGTAGCAGA GAATAATATC GATGCTGTTT AAGTTGATGT 7800
 AGTAAAAAAA CAAGCAGCGC GAGATAAAAT CACTGCTGAA GTGGcGAacG TATTGaAGCG 7860
 GTTAAACAAA CACCTAATGC AACTGACGAA GAAAAGCAGG CTGCTGTAA TCAAATCCAA 7920
 TCAACTTTAA AGATTCAAGC AATTTAATCC AAATTTAATC CAAAACCCAA ACAAATGGAT 7980
 TCAGGGTAGG ACACCACTTA CAAATCCAA 8009

(2) INFORMATION FOR SEQ ID NO: 62:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 10953 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 62:

ACCCACCCn TGGGGATAnT TTACCTGGTG GGGCCTTCGA TTGCCTTTAG GTGAAACCaG 60

EP 0 786 519 A2

AGATGAATGC TAACCATATT CATTCTGCTA AAGATGGTCG TGTTACTGCG ACAGCTGAAA 180
 TTATTCATCG AGGTAAGTCG ACACATGTAT GGGATATAAA AATTAAGAAT GACAAAGAAC 240
 5 AATTAATTAC AGTTATGCGT GGTACAGTTG CTATTAAACC TTTAAAATAA AAGAACTGCT 300
 AGCTGAAATG TTATGAGATA TTCATACTA CGGCTAGCAG TTTTATTATG CGCTATATTG 360
 TTGTAGTTTT AGAAATGCTT GTTCAATGCG TTCGGCAGCT TTACGGCCAC CCATAACATT 420
 10 TCTACCAAAT GGTCCTAATT CTAAGTCTGC AAAGCATCCT GCGACAAATA GATTTGGTAT 480
 CCATTCTAAT TTTTCGGAAA TAACAGGGTA ATTACATTCG TTGATAGGTG CATCATAATT 540
 TTGTATTAAAT TGCTTAATAA GTGGTTGTGA CATAAAATCT TGTTCAAAAC CAGTTGCAAC 600
 15 CATAATCTGT TGATATGGAA CAGAATCATT TTCAGTGTTA ATTACACCAC CACTAATTTG 660
 AGTGATAGGT GTTTTATGCa CATTTATACG ACCATTTTTA ATATGTTTTT TAAGGCGTAA 720
 20 GTACAGTTCG TGAGGCATTG ATCCTTTATG ACGTTCGCGT TGTACAATGG CATTTCTTTC 780
 AGGCATGCTT TTAGTACTTA AAAATGAAGA CATATTTTTC GGACCTAACC AACCAGGATC 840
 AGCATCAAAG TCATGTATTT CAATATCTTT ATTTAGCCAT AAATGAATCT TTTTATCGTT 900
 25 ATCATGATTT AACAATTTAA GTGCAAGATG TGCAGCAGTa ATGCCGCTAC CAACGATATG 960
 ATCGGTCTTA TCATATACTA CTTGATCAAG TTCTTTCTCG AAGATATGAT TTACATTCTG 1020
 TTTGTCTTTT AAAATGTCAG GCATAAACGG AATATTTGTA CTGCCTATTG CAATAACGAC 1080
 30 GCAATCTGTA GTGATAATTT GTCCATCTTC TAACTTGATA TGCCATTTGT CTTCTTGTTT 1140
 ATCTAAAGTT TGAACAAAC CTTGAACCAA GCAATCCTCT AATTGATATT GTTTAGAAGC 1200
 ATGTGCAATA TGATCCATAA ACATTGTCAA TTCAGGTCGT TGATAAGGAC CATAAAAAGC 1260
 35 ATTTGTATAT TGGTGCTGTT TAGCGAATTG TTTTAGATGG AACGGTTGTG GATGTACGTG 1320
 ATGTACAATC GGTGATCTTA AATAAGGCAT TTCTATTCGA TTGTATATG AGTTAAACCT 1380
 TTGGCAAAAA GTTTCGTGTG GGTCAATGAT TGTTAATCGG TCTGTTGTTA ATCCGCTTGA 1440
 40 TAATAGTTTT TGTGCGATTG CAGTTCCCTG TATGCCACCG CCGATAATTG TCCAATGCAT 1500
 AATAAAACCT CTCTCTTTTT AAAACGTAAT AGTTACGATT TATAATTATT ATTATCATAA 1560
 TACATAACGA CATGAAAGGC AATTAAATTA AAGAGATATA TGATAGTAGG GCGAATCTGT 1620
 45 AGTCAAAGAA AAAATCATTG AAAAAGAGGT AACAAATGCA AAAGAWAACA GCAGTAAAAT 1680
 CATTCTAAT TTGGAATCAT CTTACTGCTG TTTGTTGTTG ATTTATATTC ATGATTTTGT 1740
 50 TATATAATCT ACAATTTTGT GTCTTTTAAG TCTTCCGAAA TTTCATCGAC TTTAGTCTTT 1800
 TTAGTATAAG GCGTTTTAAT ATTATATGCT GCTTTCATAA TCATATGACT TGAAAGAGGA 1860

55

EP 0 786 519 A2

	GCAATAAAAT ATAAAAACGT ACCAAATAGT AATGACATTG CACCTAATGT TGATGCTTTT	1980
	CCGGCAGCAT GTGCACGTGA ATATACATCT TCAAGTCTCA ATAATCCTAT AGCTGCTAGG	2040
5	GCGCTAATTA AAGCACCGAT GATAACAAAG ATAAGTGCAA GACTAATCAG TATGATTTTG	2100
	ATCATGTTCA ATCACCTTAC CTTTGTCCAT AAATTTAGAG AATACTGCAG TACCTAAAAA	2160
	AGCTAATATA CCAATCATCA TAATAACGAC AATCATGTAT TTAATATTTA ATAAAATACT	2220
10	GAATAATGCT ATAACTGCCA TTAATTGAAG ACCAATCGCA TCTAATGCGA CAACACGATC	2280
	GGCAAGTGAT GGGCCTAGCA CAACGCGAAT GAGCATAGCT AACATAGAAA TGACAACAT	2340
15	GATTAATGCA ATAACGATAA TAACATTATG ATTCATTATA TTTGCCCCAC CTCTCTTACA	2400
	ATTTTCTCTA ATGATGTTTT AATACTTTCT ACTTCTTGCT CTTTAGTTGA AAAATCTATG	2460
	GCATGAATAT AAATTTTGT ACGATCGTCA CTTACACCAA GCACTACAGT ACCAGGTGTT	2520
20	AATGTAATTA AATTAGACAG CAAGACAATT TGCCAATCTT TTTTAAATC TGTGTGATAA	2580
	ACAAAGAATC CTGTTTCATT TTTAATCGAA GGTTTAATAA TAATTTTCAA AACATCAAAA	2640
	TTAGCTTTAA TCAGTTCGAT TAAGAAAATA ATAACTAATT TAATAATACG ATATAGCGTG	2700
25	ATGACATAAA ATCTACCTGG TAACACTCTG TGTAAGAGGT AAACAAGAAC TAGGCCAAAG	2760
	ATGAAACCTA ACACAAAGTT ATTTGTTGTG TAACTATTTG TCACAAACAA CCAAAACACT	2820
	GCGATAATAA AGTTTAAATAC TAATTGTACA GCCATGTTAT TTACCTCCTA ATACAGCTTT	2880
30	AACGTAGGTT GATGGATTGT AGAATGTTTC TGCACCAGCT TTTACCATG GATATAAGTA	2940
	ATCTGCTGAC AATCCATATA AAACAGTTAT CACAACTGCA ACGATTGCAA TCGTAGTTAA	3000
	ATATTTGACG TCGACTTGT TATTAAGATC ATATCCTTTT GGTGACCGA AAAAGCCTTG	3060
35	TAGGAATATG CGAATGACAG AATATAATAC GACTAACTT GATAATAAGA CGATGACACC	3120
	ACTTAAATAA AATCCTCTTT CAAATGTTGA TTGGACAATA AAAAATTTTC CATAAAAGCC	3180
	ACTGAGTGGG GGAATGCCAG CTAAACTTAA TGCTGCGATA AAGAATGACC AACCAAGTAC	3240
40	AGGATATCGT TTAATTAAGC CACCAAATTG TCTTAAATCA GCAGTGCCTG TAATTTTAAT	3300
	CATAATTCCG ATAAGCAAGA ATAATGCAAG TTTTACTAAC ATGTCGTGCA ATGTATAGTA	3360
45	AATAGCCCCA ATCATACTG ACTCTGTCAT CATTGCAACG CCGACTAAGA TCACACCTAC	3420
	AGCAATCATG ACAATTGTATA GGATGATTTT TTTAATGTTG GCATATGCAA CAGCACCGAC	3480
	ACAACCAAAG ATGATCGTTA ATAGTGCTAA GAATAAAATG ACATAATGTG AAAAGCTTAC	3540
50	ATTATCACTA AAGAATAGGC TCAATGTTCT AGCGATTGCA TAAACACCAA CTTTGTGTTAA	3600
	CAAAGCACCA AAGAATGCAA TGATTGGAAT TGGTGGCAT AGTATGCACT AGGTAACCAA	3660

55

EP 0 786 519 A2

	ATATTGACTA AGCCACTGTC ATGCGCTGAA AGGTTAGCTA ATTTATTGCT TATATCTGCT	3780
	AGATTCAATG TTCCTACTAC TGAATATAAA ATCGCTACAC CCATTACGAA GAAGGATGAC	3840
5	GATACAACGT TAACAAGAAC ATATTTTATT GTTCTTGTA GTTGAATTTT TGTAGAACCA	3900
	ATTACTAATA AGAAATAAGA TGACATTAAA AATACTTCGA AAAATACGAA TAGGTTGAAA	3960
	ATGTCACCAG TTGTGAATGC ACCAATGATA CCTATTACA TAAATAGTAC TGAAAAATAA	4020
10	TAATAATATC TTTCACGTTT AATACCAATT GTTTGGTATG AATATAAAAT CACAATAGCT	4080
	GTAATAATAA TACTAGTAAT TATTAGTAGG GCACTGAATA TGTCTAATAC AAAGACAATA	4140
	CTGTATGGTG CTTTCCATGA ACCTAGCTCT ACGCGTATTG GTCCATGTTT AACAAACATT	4200
15	GCTAAATTGA TAATTGCCGC GACCAAGGTT AATAATGTAC CGCCTAGTGC GACATAACGC	4260
	TTTATAATAG GACGCTTTCC AATAAAGACA AGTAATATGG CTGTAATTAC TGGAATAACT	4320
	AGCGTTAACA CAAGCATATT ACTTTCAATC ATCTTCTGGA ACTCCTTTCA TACTCTCAAC	4380
20	GTTATCTGTG CCTAATTCTT TATATGTTCT AAATGCTAAT ACTAAGAAAA AGGCTGTTGT	4440
	CGCAAGGCGA TAACGATTGC TGTTAAATA AGTGCTTGC GGTAGGATC AACATAGCTT	4500
25	TTTACGTTTG CTTTCAAAAT TGGAACAGTA CCATGTTTAA GTCCGCCCAT AGTTATTAAA	4560
	AATAAAATTG CTGCATGTGT TAATAGTGTA GTTCCCATAA CAATTCGTAT CAGACTTTTA	4620
	GACAAAACGA GATAGACACT AATTGCTGTG AGAATACCAC TAACAAAAAT CATAATAATT	4680
30	TCCACTATTC GTTCTCTCCA ATCGAAATAA TAATTGTCAT GACAGTACCA ACTACTGCAC	4740
	ATAAACACC GAAATCAAAG AATACTGCTG TTGTCATATG AACAGGTTCT AATATAAATA	4800
	ACGGTATATC AAATGTGACA TGCGTAAAGA AATTTTGTCC TAAAAACCA CTTGCGATAG	4860
35	GCGTCGCAAT ACAAAAAACT AATCCGATAC CTATCAAGAT TTTAAATCT AATGGGAAAA	4920
	TTTTACGCAT TGTTCTATA TCAAATGCAA TCGTAATGAT AACAAGTGAA CTTGCGAATA	4980
	ATAATCCGCC GACGAAACCG CCACCAGGTG TATAATGTCC TGCTAAGAAA AGTGAAAAAC	5040
40	CAAAGACCAT TACCATGAAA AAGATAATAA CTGCAGCAA TTGCAAAATT AGATCATTTT	5100
	GTTGTCTATT CATGATTTTT CACCTCGTTA CCTTGCCTT GACGCTTTTT ACGTAATTTA	5160
45	ATCATTGTAT ATACAGCTAA TCCTGCGATA CCAAGCACAG ATGACTCGAA TAAAGTATCC	5220
	ATACCACGGA AATCAACAAG TATGACGTTT ACCATGTTTT TACCGTGAGC TAAATCATAA	5280
	ACGTGCTCTT GATAAACTT AGATATCGAT TCAAAATGTC TATTTCCGTA TGCAATTAAA	5340
50	CCGATAATAA TGACGGACAA ACCAACACCA CCAGCAATTA AAGCATTAGT AAGCTGGAAT	5400
	GAGCGCTTTT CATTATAACG ATTTAAATTT GGTAAGTGGT AGAAGCATAA TAAGAACAAT	5460

55

5
 10
 15
 20
 25
 30
 35
 40
 45
 50
 55

ATAAACAATA CAGACACAGC ATATCCAAC TACTTAACA TAATGATGCT AAATAATCTT 5580
 GATTTAGCGA AAAGAATTAA AAAGGCAGCA CTTAATAATA AAATTACGAT ACAAACTTCG 5640
 AAAATTCTAA TCGGACTAAC GTCTTTAAAA TTAATGTTGA AAGGTACTGA GAATATAGTG 5700
 ACAATGTGA ATAAAATTAA TGCACCAAAA ATGATAACTA AATTATTACG TGAATAATCG 5760
 GTAACATAGC TATTCGTCAT CTTTTCAGAG TAGTTTGAA TAACATTTGC ACTTCTGTTG 5820
 TACCAATAAT TGAATGTTAG TTTACCAGGT TGTCGTTGCA ACAATTTTAC CCAATAACTA 5880
 AATGTCACAA TTAGTAAGAT ACCTAAAATA TAAATCACTA ATGTTGATAA AAAGGCAGGC 5940
 GTTAATCCAT GGAACATATG GAATTCAACA TCATCAATTA CCGTATGATT AATCGAAGag 6000
 TnAGCTGGTT CAATAATCGA ATTAGTTAAA ATGCCAGGGA ATAAACCAA TACAATTACT 6060
 AATGTAGCTA AAATAGCTGG TGATAAAAGC ATTAATATTG ATACTTCGTG TGCTTTTITA 6120
 GGTAATTGTT CAGGTTTATA TTGTCCGAAA AATATATGCA TTATAAATT AATTGAATAT 6180
 ACAATGTGA AGACACTGCC CACTATACCA ATGATTGGGA ATAGGTAGCC TAATGTATCA 6240
 ACACTGAATA AATTTGCTTG GCTTGCTGTA AATGTTGTTT CTAAAAATGA TTCTTTTGAT 6300
 AAGAAACCAT TGAACGGTGG TACACCAGCg CATACTTAAT GCTGTAATAA CAGTGATTGT 6360
 AAATGAAATA GGCATAATTG TTAGTAAGCC ACCTAATTC TTAACATCAC GTGTACCAGT 6420
 AGAATGATCC ACTGCACCTG TAATCATAAA TAGGGCACCT TTAAATGTTG CATGGTTGAT 6480
 TAAATGGAAT ATTGCAGCCG TAAATGCAGC AGCATATATT TTGCTATCAT CGCCTTGATA 6540
 GTGATAACTA ATGGCACCGA TTCCAAGCAT CGCCATAATC ATACCTAATT GGGATACTGT 6600
 TGAAAATGCC AGTATACCTT TCAAGTCTTG TTGTTTTGTT GCGTTTAGCG AAgCCCAGAA 6660
 TAATGTAATT AAACCAACGA GTGTGACAGT CCATACCCAA CCTTGCGATG CTGCGAAGAT 6720
 TGGTGTCAATT CGAGCGATTA AATATAACCC TGCTTTAACC ATTGTTGCTG AATGAAGATA 6780
 AGCACTGACT GGTGTAGGTG CTTCCATTGC ATCTGGTAGC CAAATATAAA ATGGAACTG 6840
 AGCAGATTTT GTAAAAGCAC CAATCATGAT TAAATCATC GCAAAAATGA AGAATGGGCT 6900
 ATTTTGAATT TCAGAAGCAT GTTGAATCAT GTACTGAATG CTAAATGATT GTGTGGTAT 6960
 AGCGAGTAAG ATGATACCAC CTAATAATGA TAGACCACCA AATACTGTGA TTATGAGCGA 7020
 TTTTGTAGCA CCATATATAG ATGCTTGTCG TTCGCGCCAG AATGAAATAA GTAAAAAACT 7080
 AGAAAAATGAC GTTAGCTCCC AGAATAAATA TAGAATAATA ACATTATCTG AAAGTACGAC 7140
 ACCTAACATT GCACCCATAA ATAGTAATAA ATAACAATAA AAATCCCTA GTTGTCTGA 7200
 CTTACTTAAG TAGCCGATTG AATATAATAC TACTAACTG CCGATTCTG AAATAAGCAA 7260

EP 0 786 519 A2

CCAATTTAAG GTTTTCATTA CAGTATTACC TGACATCGTC GTTTAAATTA ATGTAAGCAT 7380
 ATAAATAAAT ATGACGATAG GGACAGGTAA TACGAACCAT CCTAAATGTA TACGTTTAAA 7440
 5 AAATCTATAC AGGATAGGAA TAATGAGTGC GAATATTAAAC GGTAATATCA CCGCAATATG 7500
 TAACAAACTC ACTATGTTGT CCTCCTTTAA AAAATATTTA TGTATTTCAT TATACATGAA 7560
 TGATATAGTT CTGAAAAACG TACACACTCC TTGTTGTGCT TTATTTTCAG AaGTATTTAA 7620
 10 ATAAGAAGAA ACACGTCATT TTTTATTTAA AATTTTCTTT GTATTGAAGT GAATAATCTT 7680
 CTTTTAAGCG TGCTAAACTA GCTAAAGACA TTTCAGCATG TTTTGTGTC TGAGCTTTAA 7740
 GTTTAGTTTC TAAATCTGTA ATTGCTTGTT GAAGTGAATC TTCATAGCGC AATACATCAA 7800
 15 CATTGAAGTC GCGTAATTGT GAACGTTTCG TATAGCGTTT TTCAAAATGG CTTAATGCTT 7860
 TGCGGTCATG GAAAAATACA CCTTCAGTTT CAGTAGGGTT ATGTAAATCA CCTTGTTCG 7920
 20 GGTGTTTGAT AACTTGTTCA ACTTTAACAA GGACATCGTC TCCATTTTCT TCAACAATCG 7980
 TGACACCATA GCTACCTGTT TTGTGTGAAA ATCGATATAG CTTCATGCTA TTTTCCTCCC 8040
 TTAAAAGTAT GTTAATATAT ATGTATCATA ACATGAATGG AGAATATAAA TGGCTAACTA 8100
 25 TCCACAGTTA AACAAAGAAG TACAACAAGG TGAAATCAAA GTGGTTATGC ACACAAATAA 8160
 AGGTGACATG ACATTCAAAT TATTTCCAAA TATTGCACCA AAAACAGTTG AAAATTTTGT 8220
 GACACATGCA AAAAATGGTT ATTATGATGG AATCACATTC CACCGTGTCA TTAATGACTT 8280
 30 CATGATTCAA GGTGGCGATC CAACAGCTAC TGGTATGGGT GCGGAAAGTA TTTATGGCGG 8340
 TGCTTTTGAA GATGAATTTT CATTAAATGC ATTTAACTTA TATGGCGCAT TATCAATGGC 8400
 TAACTCAGGA CCTAATACTA ATGGTTCACA ATTTTTCATT GTTCAAATGA AAGAAGTACC 8460
 35 TCAAAATATG TTAAGTCAAC TTGCAGATGG TGGCTGGCCT CAACCAATCG TTGATGCATA 8520
 TGGCGAAAAG GGTGGTACAC CATGGTTAGA TCAAAAACAT ACAGTATTCG GTCAAATCAT 8580
 TGATGGTGAA aCTACATTAG AAGATATTGC AAATACAAAA GTGGGACCAC AAGATAAACC 8640
 40 ACTTCATGAT GTTGTAATTG AATCTATTGA TGTGAAGAA TAATATCTAA ACATAATTAA 8700
 CTACCAACAT TTTAAACTCG GATAAAGCTA ATTTATGAAT GGATTAGTAT ATATTCCAAC 8760
 45 gAAAATAAAT AAATAATAT GATGAGCAAT CTCAATATAT TTATCaAGAA AGCACAGTTT 8820
 TTAAATAGAT GTGTATTTTA AAGATAATAG TTGAGGTTGC TTTTATGTT TTTACAGAGA 8880
 ATTGCTATTC AAATAGTAAA TAAATTGAAA ACAAAGTAGC TGGATATCAT ATTGATTTAG 8940
 50 ATAGGAATTT GTTGCTAATT TTATTTGTAA ATCCAAGTTT GTAGAATTCT TATTCATTTA 9000
 TAAATAATA TTCGTATGAT TTGATTTTTT AATTAGTCCA CCATTCGAT TTGTGCTATG 9060

55

EP 0 786 519 A2

	AACATATCAA GGTGCGTGTA CTGGTATTCA ACCATACGGT GCGTTTGTG AGACCCCTAA	9180
	TCATACTGAA GGACTGATTG ATATATCAGA AATTATGGAT GACTACGTTC ATAATTTGAA	9240
5	GAAATTTCTA TCAGAAGGCC AAATTGTTAA AGCTAAAATT TTGTCTATAG ATGATGAAGG	9300
	AAAGCTTAAT CTATCATTAA AGGATAATGA TTAAGTTCAA AATTATGAGC GTAAGAAGGA	9360
	AAAACAATCA GTATTAGATG AAATCAGAGA AACAGAAAAA TATGGGTTTC AAACACTTAA	9420
10	AGAACGCTTA CCAATCTGGA TAAAACAGTC AAAGCGAGCA ATTCGAAACG ACTAAAGGAA	9480
	CAGATAAATC GTACCGAAAA TCATACAAAG GGTCTGAAAT GAAAGTTTCT TAGACTATAA	9540
	AAGAGATTAG TATCTATTAA ATTTTATTAG ATACTAATCT CTTTTTGTCT ACGATAACGT	9600
15	AATATGATTG ATTCTATTAA CACGTACAAA TGGTTTAAGG TGACATATCC ATTATCTTTG	9660
	TTAGATAGAA TCGTTGATTG GCaATATTGT ATGTGGATTG GTTTTTTTTA TTTATTTTAG	9720
20	AAATGAGAAC TACAACCTAA AGTATTAAAC GAATTGCAAC TATATAAACA GATAATTGGA	9780
	GAATGAAAAA ATTACATGTT ATAGTCAACT CAATAATTTT AAGGAGGAAT TAAGTAATGA	9840
	AAAGTAAATA CGAACCATTG TTTGATAAAG TAGAATTACC AAATGGAGTA GAGTTGAGAA	9900
25	ATCGATTTGT GTTAGCCCCT TTAACACATA TTTCTTCAA TGATGATGGT ACTATTTTCTAG	9960
	ATGTAGAACT TCCTTATATT GAAAAGCGTT CACAAGATGT TGGTATTACA ATTAATGCTG	10020
	CGAGTAATGT GAGTGATGTC GGAAAAGCAT TTCCAGGACA GCCATCAATC GCGCATGACA	10080
30	GTAATATTGA AGGACTAAAA CGATTAGCTA CAGCAATGAA GAAAAACGGT GCCAAAGCAC	10140
	TCGTACAAAT ACATCATGGC GGTGCACAAG CATTGCCTGA ATTAACACCT GATGGAGACG	10200
	TCGTAGCACC AAGTCCAATT TCTTTAAAAA GTTTTGGTCA GAAACAAGAA CATAGTGCTA	10260
35	GAGAAATGAC GAATGAAGAG ATTGAACAAG CAATCAAGGA TTTTGGTGAA GCAACGCGAC	10320
	GTGCAATTGA AGCAGGGTTT GATGGTGTG AAATACATGG CGCGAATCAT TACTTAATTC	10380
40	ATCAATTTGT ATCACCATAC TATAATAGAA GAAATGATGT ATGGGCAAAT CAATATAAAT	10440
	TCCCGGTCGC TGTGATTGAA GAAGTACTTA AAGCGAAAGA AGCGTATGGC AATAAAGACT	10500
	TTATAGTTGG ATACAGATTA TCTCCAGAGG AAGCGGAGTC TCCAGGAATC ACAATGGAAA	10560
45	TTACAGAGGA ACTCGTTAAT AAAATTAGCC ATATGCCAAT CGACTATATT CATGTTTCAA	10620
	TGATGGATAC GCATGCAACG ACACGTGAAG GTAAATACGC TGGACAAGAA AGACTGCCTT	10680
	TAATTCACAA ATGGATAAAT GGTGCTATGC CACTTATCGG TATTGGTTCA ATTTTCACAG	10740
50	CTGACGAAGC TTTAGATGCA GTTGAAAATG TTGGTGTGTA CTTAGTAGCC ATTGGTAGAG	10800
	AGCTACTACT GGATTATCAA TTTGTTGAAA AAATTAAAGA TGGACGGGAA GATGAAATTA	10860
55		

AATTTAATGA AGGGTTTTAT CCATTACCAC GTA

10953

(2) INFORMATION FOR SEQ ID NO: 63:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 8155 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 63:

15	TTTGATAnAA AACTGAATnA ATTAAATGTA TCGATTCAAC CTAATGAAGT GAATTTACAA	60
	GTTAAAGTAG AGCCTTTTAG CAnAAAGGTT AAAGTAAATG TTAAACAGAA AGGTAGTTTA	120
	GCAGATGATA AAGAGTTAAG TTCGATTGAT TTAGAAGATA AAGAAATTGA AATCTTCGGT	180
20	AGTCGAGATG ACTTACAAAA TATAAGCGAA GTTGATGCAG AAGTAGATT AGATGGTATT	240
	TCAGAATCAA CTGAAAAGAC TGTA AAAATC AATTTwCCAG AACATGTCAC TAAAGCACAA	300
	CCAAGTGAAA CGnAGGCTTA TATAAATGTA AAATAAATAG CTAAATTAAA GGAGAGTAAA	360
25	CAATGGGAAA ATATTTTGGT ACAGACGGAg TAAGAGGTGT CGCAAACCAA GAACTAACAC	420
	CTGAATTGGC ATTTAAATTA GGAAGATACG GTGGCTATGT TCTAGCaCAT AATAAAGGTG	480
	AAAAACACCC ACGTGACTT GTAGGTCGCG ATACTAGAGT TTCAGGTGAA ATGTTAGAAT	540
30	CAGCATTAAAT AGCTGGTTTG ATTTCAATTG GTGCAGAAGT GATGCGATTA GGTATTATTT	600
	CAACACCAGG TGTTCATAT TTAACACGCG ATATGGGTGC AGAGTTAGGT GTAATGATTT	660
	CAGCCTCTCA TAATCCAGTT GCAGATAATG GTATTAAATT CTTTGATCA GATGGTTTTA	720
35	AACTATCAGA TGAACAAGAA AATGAAATTG AAGCATTATT GGATCAAGAA AACCCAGAAT	780
	TACCAAGACC AGTTGGCAAT GATATTGTAC ATTATTCAGA TTACTTTGAA GGGGCACAAA	840
	AATATTTGAG CTATTTAAAA TCAACAGTAG ATGTTAACTT TGAAGGTTTG AAAATTGCTT	900
40	TAGATGGTGC AAATGGTTCA ACATCATCAC TAGCGCCATT CTTATTTGGT GACTTAGAAG	960
	CAGATACTGA AACAAATTGGA TGTAGTCCTG ATGGATATAA TATCAATGAG AAATGTGGCT	1020
45	CTACACATCC TGAAAAATTA GCTGAAAAAG TAGTTGAAAC TGAAAGTGAT TTTGGGTTAG	1080
	CATTTGACGG CGATGGAGAC AGAATCATAG CAGTAGATGA GAATGGTCAA ATCGTTGACG	1140
	GTGACCAAAT TATGTTTATT ATTGGTCAAG AAATGCATAA AAATCAAGAA TTGAATAATG	1200
50	ACATGATTGT TTCTACTGTT ATGAGTAATT TAGGTTTTTA CAAAGCGCTT GAACAAGAAG	1260
	GAATTAAATC TAATAAAACT AAAGTTGGCG ACAGATATGT AGTAGAAGAA ATGCGTCGCG	1320

EP 0 786 519 A2

	CTGGTGATGG TTTATTAAC T GGTATTCAAT TAGCTTCTGT AATAAAAAATG ACTGGTAAAT	1440
	CACTAAGTGA ATTAGCTGGA CAAATGAAAA AATATCCACA ATCATTAAAT AACGTACGCG	1500
5	TAACAGATAA ATATCGTGTT GAAGAAAATG TTGACGTTAA AGAAGTTATG ACTAAAGTAG	1560
	AAGTAGAAAT GAATGGAGAA GGTGGAATTT TAGTAAGACC TTCTGGAACA aACCATTAGT	1620
	TCGTGTCATG GTTGAAGCAG CAACTGATGA AGATGCTGAA aGATTGTCAC AACAAATAGC	1680
10	TGATGTGGTT CAAGATAAAA TGGGATTAGA TAAATAAATA CTGTATTACA AATGAGCCGA	1740
	TGCGTATGcA nTcgtTTTTT GTGTTTGTAG AAATAATTTA TAGTACAAAC GTAAAATGAT	1800
	ATAAACAAAA TAAAAACAAA GTAATCAATA TGTAATATAA AATACACTGG TACTCAATAT	1860
15	ATAATGATGA TAAATTAAT TTTAATTAGA TAGAGTTGCT TTGTGTTTTT AACGCAGATG	1920
	CTACTACTTA TCTTAACAGT TGATTAAGTG AAATCATTTA ACAGCGAGAA TAATCAACCA	1980
20	GGAGGATGAC TTAATGAATT TATTCAGACA ACAAAAATTT AGTATCAGAA AATTTAATGT	2040
	CGGTATTTTT TCAGCTTTAA TTGCCACTGT TACTTTTATA TCTACTAACC CGACAACAGC	2100
	GTCTGCAGCA GAGCAAAATC AGCCTGCACA AAATCAACCA GCACAACCAG CTGATGCCAA	2160
25	TACACAGCCT AACGCAAATG CTGGTGCTCA AGCTAATCCT ACAGCACAGC CAGCTGCACC	2220
	TGCCAACCAA GGACAACCAG CAGTACAACC AGCAAACCAA GGTGGACAGG CTAATCCAGC	2280
	AGGAGGAGCA GCACAACCAA ATACACAACC AGCTGGACAA GGTGATCAAG CTGATCCGAA	2340
30	TAACGCTGCA CAAGCACAACT CTGGAAATCA AGCAACACCG GCAAACCAAG CAGGTCAAGG	2400
	AAATAACCAA GCAACACCTA ATAATAATGC AACACCGGCA AATCAAACAC AGCCAGCGAA	2460
	TGCTCCAGCA GCAGCGCAAC CAGCAGCACC TGTAGCAGCA AACGCACAAA CTCAAGATCC	2520
35	AAATGCTAGC AATACTGGTG AAGGCAGTAT TAATACGACA TTAACATTTG ATGATCCTGC	2580
	CATATCAACA GATGAGAATA GACAGGATCC AACTGTAAC TTTACAGATA AAGTAAATGG	2640
40	TTATTCATTA ATTAACAACG GTAAGATTGG TTTCGTTAAC TCAGAATTAA GACGAAGCGA	2700
	TATGTTTGAT AAGAATAACC CTCAAAATA TCAAGCTAAA GGAAACGTGG CTGCATTAGG	2760
	TCGTGTGAAT GCAAATGATT CTACAGATCA TGGTAACTTT AACGGTATTT CAAAAACTGT	2820
45	AAATGTAAAA CCAGATTCAG AATTAATTAT TAACTTTACT ACTATGCAAA CGAATAGTAA	2880
	GCAAGGTGCA ACAAATTTAG TTATTAAAGA TGCTAAGAAA AATACTGAAT TAGCAACTGT	2940
	AAATGTTGCT AAGACTGGTA CTGCACATTT ATTTAAAGTA CCAACTGATG CTGATCGTTT	3000
50	AGATTTACAA TTTATTCCTG ACAATACAGC AGTTGCTGAT GCTTCAAGAA TTACAACAAA	3060
	TAAAGATGGT TATAAATACT ATTCATTCAT TGATAATGTA GGTCTATTCT CAGGATCACA	3120

55

EP 0 786 519 A2

	TAATACTGAA ATCGGTAACA ATGGTAATTT TGGTGCTTCA TTAAAAGCAG ATCAATTTAA	3240
	ATATGAAGTA ACATTACCAC AAGGTGTAAC TTACGTTAAT AATTCATTAA CTACAACATT	3300
5	CCCTAATGGT AATGAAGACA GTACAGTATT GAAAAATATG ACTGTTAATT ATGATCAAAA	3360
	TGCAAATAAA GTTACATTTA CAAGCCAAGG TGTGACAACG GCACGTGGTA CACACACTAA	3420
	AGAAGTTTTA TTCCCAGATA AATCTTTAAA ATTATCATAT AAAGTTAATG TTGCGAATAT	3480
10	CGATACACCT AAAAATATTG ATTTTAATGA AAAATTAACA TATCGTACTG CTTCAGATGT	3540
	TGTAATTAAT AATGCGCAAC CAGAAGTACA CTAAGTGCAG ATCCATTTTC AGTAGCGGTT	3600
	GAAATGAACA AAGATGCGTT GCAACAACAA GTAACTCAC AAGTTGATAA TAGTCATTAC	3660
15	ACAACAGCAT CAATTGCAGA ATACAATAAA CTAAACAAC AAGCAGATAC TATTTTAAAT	3720
	GAAGATGCGA ATCATGTTAA AACTGCAAAT CGTGCACTC AAGCGGATAT TGATGGTTTA	3780
20	GTAAGTAAAT TACAAGCTGC ATTAATTGAT AATCAAGCAG CAATTGCTGA ATTAGATACT	3840
	AAAGCTCAAG AAAAGGTTAC AGCAGCACAA CAAAGTAAAA AAGTTACGCA AGATGAAGTT	3900
	GCAGCACTTG TAACTAAAAT TAACAATGAT AAAAATAATG CAATCGCAGA AATTAATAAA	3960
25	CAAACTACAG CACAAGGTGT CACAAGTAA AAAGATAATG GTATCGCAGT GTTAGAACAA	4020
	GATGTGATTA CACCAACAGT TAAACCTCAA GCGAAACAAG ATATTATCCA AGCAGTTACA	4080
	ACTCGTAAAC AACAAATTAA AAAGTCAAAT GCATCATTAC AAGATGAAAA AGATGTAGCA	4140
30	AATGATAAAA TTGGTAAAAT TGAAACAAAG GCAATTAAAG ATATTGATGC AGCAACAACA	4200
	AATGCACAAG TAGAAGCCAT TAAAACAAAA GCAATCAATG ATATTAATCA AACTACACCT	4260
	GCTACAACAG CTAAAGCAGC AGCTCTTGAA GAATTTGACG AAGTTGTTCA AGCACAATT	4320
35	GATCAAGCAC CTTTAAATCC TGATACAACA AATGAAGAAG TAGCGGAAGC TATTGAACGT	4380
	ATTAATGCAG CTAAAGTTTC TGGTGTTAAA GCAATTGAAG CGACAACGAC TGCACAAGAT	4440
	TTAGAAAGAG TTAAAAACGA AGAAATCTCA AAAATTGAAA ATATTACTGA CTCTACGCAA	4500
40	ACAAAAATGG ATGCCTATAA TGAAGTTAAA CAAGCTGCAA CAGCTAGAAA AGCTCAAAAT	4560
	GCTACAGTTT CAAATGCAAC AAATGAAGAA GTAGCAGAAG CTGATGCAGC AGTAGATGCA	4620
45	GCTCAAAAGC AAGGTTTACA TGACATCCAA GTTGTTAAAT CAAAACAGGA AGTTGCTGAT	4680
	ACAAAATCAA AAGTATTAGA TAAAATCAAT GCAATTCAAA CACAAGCAAA AGTTAAACCT	4740
	GCAGCTGATA CGGAAGTAGA AAACGCATAT AATACACGTA AACAAGAAAT TCAAAATAGC	4800
50	AATGCTTCAA CTACAGAAGA AAAACAAGCT GCATATACAG AATTAGATAC TAAAAAGCAA	4860
	GAAGCAAGAA CAAATCTTGA TGCTGCAAAT ACAAACAGTG ATGTAACAAC AGCTAAAGAC	4920

55

EP 0 786 519 A2

	GCGGAAATCG CTCAAAAAGC AAGTGAACGT AAAACAGCAA TTGAAGCAAT GAATGATTCTG	5040
	ACTACTGAAG AACAAACAAGC AGCGAAAGAC AAAGTGGATC AAGCAGTAGT TACTGCAAAC	5100
5	GCTGATATAG ATAATGCTGC AGCAAACAAT GATGTGGATA ATGCAAAAAC TACAAATGAA	5160
	GCTACAATCG CAGCCATTAC ACCTGATGCA AATGTTAAAC CAGCAGCAAA ACAAGCAATT	5220
	GCAGATAAAG TACAAGCTCA AGAAACAGCA ATTGATGGAA ATAACGGCTC AACAACTGAA	5280
10	GAAAAAGCAG CTGCTAAACA ACAAGTTCAA ACTGAAAAAA CAACAGCTGA TGCCGCAATA	5340
	GATGCAGCAC ATACAAATGC GGAAGTTGAA GCGGCTAAAA AAGCAGCAAT TGCTAAAATT	5400
	GAAGCGATTG AGCCAGCAAC AACAACTAAA GATAATGCGA AAGAAGCAAT TGCTACGAAA	5460
15	GCGAATGAAC GTAAACAGC AATCGCTCAA ACGCAAGACA TTACTGCTGA AGAAATTGCA	5520
	GCGGCTAATG CGGACGTAGA TAATGCTGTG ACACAAGCAA ATAGCAACAT TGAAGCTGCT	5580
20	AATAGTCAAA ATGATGTAGA CCAAGCGAAA ACGACAGGTG AAAATAGTAT TGATCAAGTA	5640
	ACACCAACAG TTAATAAAAA AGCAACTGCA CGTAATGAAA TCACAGCAAT TTTAAATAAC	5700
	AAATTGCAAG AGATTCAAGC TACGCCAGAT GCAACAGATG AAGAAAAACA AGCAGCTGAT	5760
25	GCTGAAGCAA ATACTGAAAA TGGTAAAGCA AATCAAGCCA TTTCAGCAGC AACTACTAAC	5820
	GCACAAGTTG ATGAAGCTAA AGCAAATGCA GAAGCAGCGA TTAATGCGGT AACACCAAAA	5880
	GTTGTGAAGA AACAAAGCGGC TAAAGATGAA ATTGATCAAT TACAAGCAAC GCAAACAAAT	5940
30	GTTATCAATA ATGATCAGAA CGCTACAACA GAAGAAAAAG AAGCAGCTAT TCAACAATTA	6000
	GCAACAGCAG TTACAGACGC GAAAAATAAT ATTACAGCTG CAACTGATGA TAATGGTGTA	6060
	GATCAGGCGA AAGACGCTGG AAAGAATTCA ATTCAAAGCA CGCAACCAGC AACAGCGGTT	6120
35	AAATCAAATG CTAAAAATGA TGTGATCAA GCTGTGACAA CTCAAAATCA AGCAATTGAT	6180
	AATAEAACTG GTGCTACAAC TGAAGAGAAA AATGCAGCAA AAGATTTAGT TTTAAAAGCT	6240
	AAAGAAAAAG CGTATCAAGA TATCTTAAAT GCACAAACAA CTAATGATGT TACGCAAATT	6300
40	AAAGATCAAG CAGTTGCTGA TATTCAAGGT ATTACTGCAG ATACAACAAT TAAAGATGTT	6360
	GCGAAAGATG AATTAGCAAC AAAAGCAAAC GAACAAAAAG CGCTTATTGC ACAAACTGCA	6420
45	GATGCGACTA CTGAAGAAAA AGAACAAGCA AATCAACAAG TAGACGCACA ATTAACACAA	6480
	GTAATCAAAA ATATTGAAAA TGCACAGTCA ATCGATGATG TAAACACTGC AAAAGATAAT	6540
	GCAATTCAAG CAATTGACCC AATTCAAGCA TCAACAGATG TTAAAACGAA TGCAAGAGCG	6600
50	GAATTGCTAA CTGAAATGCA AAATAAAATA ACTGAAATAC TTAATAATAA TGAGACTACT	6660
	AATGAAGAAA AAGGTAACGA TATTGGACCA GTTAGAGCAG CATATGAAGA AGGTTTAAAT	6720

55

EP 0 786 519 A2

	AAAGTTCAAC AACTTCATGC AAATCCTGTT AAGAAACCAG CAGGTAAAAA AGAATTAGAT	6840
	CAAGCTGCAG CTGATAAGAA AACACAAATA GAACAAACAC CAAATGCATC ACAACAAGAA	6900
5	ATTAATGATG CAAAACAAGA AGTTGATACT GAATTAAATC AAGCGAAAAC AAATGTTCGAT	6960
	CAATCATCAA CAAATGAATA TGTTGATAAT GCAGTTAAAG AAGGAAAAGC TAAAATTAAT	7020
	GCAGTTAAAA CATTTAGTGA GTACAAAAAA GATGCTTTAG CTAAAATTGA AGATGCATAT	7080
10	AATGCTAAAG TAAACGAAGC GGATAACTCT AACGCATCGA CTTCAAGTGA AATTGCTGAA	7140
	GCGAAACAAA AACTTGCTGA ATTAAAACAA ACTGCCGATC AAAATGTTAA TCAAGCTACT	7200
	TCTAAAGATG ACATTGAAGT TCAAATTCAT AATGACTTAG ATAATATTAA CGATTACACA	7260
15	ATTCCAACAG GTAAAAAGA ATCAGCTACA ACAGATTTAT ATGCTTATGC AGATCAGAAG	7320
	AAAAATAATA TTTCAGCTGA CACTAATGCA ACACAAGATG AAAAGCAACA AGCAATTAAG	7380
	CAAGTTGACC AAAATGTTCA AACTGCATTA GAAAGCATTAA ATAATGGTGT GGATAATGGT	7440
20	GACGTTGATG ATGCATTAAC ACAAGGTAAA GCAGCAATTG ATGCTATTCA AGTAGATGCT	7500
	ACTGTTAAAC CTAAAGCGAA CCAAGCTATT GAAGTTAAAG CAGAAGATAC GAAAGAATCT	7560
25	ATTGATCAAA GTGACCAAGT AACTGCTGAA GAAAAAACTG AAGCATTAGC AATGATTAAA	7620
	CAAATTACAG ATCAAGCTAA ACAAGGTATT ACTGATGCAA CAACAACTGC TGAAGTTGAA	7680
	AAAGCGAAAg cTcAAGGACT TGAAGCATTT GATAACATTC AAATCGACTC AACAGAAAAA	7740
30	CAAAAAGCTA TCGAAGAATT AGAAACTGCA CTAGACCAGA TTGAAGCAGG TGTAATGTC	7800
	AACGCTGATG CTACAACTGA AGAAAAAGAA GCGTTTACGA ATGCTTTAGA AGACATTTTA	7860
	TCAAAAGCAA CTGaAGATAT TTCTGATCAA ACTACAAATG CAGAAATCGC TACTGTCAA	7920
35	AATAGTGCGC TTGAACAAC TAAAGCACAA CGTATTAATC CTGAAGTTAA GAAAAATGCT	7980
	TTGGAAGCAA TCAGAGAAGT GGTTAACAAG CAAATAGGAA tAATTAAAAA TGCAGATGCA	8040
	GATGcATCGG CGGAAAGAnA TTGCACGTAC GGGATTTAGG TAGATATTTT GGACCGATTT	8100
40	GCTGGATAAA TTTAGGGThA AACCCCAACC AATGCCGAAG TTGCCTGAAT TACCA	8155

(2) INFORMATION FOR SEQ ID NO: 64:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1630 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 64:

EP 0 786 519 A2

	CTGTTTTATT TGCAGCACCC ATACTGGAAA TCACTTTAAT CCCTCGGTCA AGACACTCTT	120
	TCATTAAGTG TACTTTGTAC ATTATTGTAT CACTTGCATC TACAAAATAA TCTATATCGT	180
5	AGTTATCGAA AATTTCTTCA TATGTCTCTT CTGTATAAAA CATATGTAAG GGC GTGACTT	240
	TACAATCTGG ATTAATTAAT TTAATACGTT CTTCCATCAA AGAAACTTTA CTTTGTCTTA	300
	CCGTTGTAGT TAAAGCGTGT AATTGTCTGT TTACATTTGT AATATCAACA TCATCTTTAT	360
10	CTATTAATAT AATATGACCA ATATTGTTT TGTCTAATGC TTCAGCAGCA AATGAACCAA	420
	CACCTCCAAC GCCAAGTATG ACAACAGTTT GTTGCTTCAA TAAATCTAAA CCTTGTGTGC	480
	CAATCGCTAG TTCATTTCTT GAAAATTGAT GTTTCATTAT TTTACCTCTT TCACTGATTT	540
15	ATACATAAGT ACATAGTAAC TTAATAATTT ATATTAGCA TTATCACTTT GATTATTTTC	600
	CCAAAATTCA ACGAGGAAAC ATTTATTAAA CGCTATAAAA CCCAACTAAT TCTTTATTAA	660
	AAACTTAAAG AAACGCATAA AAATACGCAA GACAAAGTCT TGC GTATCGA TAGAGTCCGT	720
20	ATTGCCGTAG TTATAATAGC TTGATCATTC GGCCTGTTAT ATACAGGTGG GTGCCCTGTT	780
	TCTTGTTTTG TACGTCCTTC ATATAAGGCG TGTACGCTGC AAGAAAACCC ATTGGGCTCC	840
25	CTTGATCAAA GAGTGTTAGG CCCAAATTAA AAAGCAAAC TACGAACAAC TCAGATGACT	900
	ATCTTATGAT GTTATATTAC CACATAATTA AAATTAATGA AATTATAACA AACCAGTT	960
	TATTGATTTT TTAATAATTA GTGACGAATT CGCAAAGAAA GTTCTTCTAA TTGTTTATCA	1020
30	GAAACTTCAC TAGGCGCATT CGTTAATAAA CATGTAGCAG ATGCTGTTT AGGGAATGCG	1080
	ATTGTATCTC TCAAGTTTGT TCTATTAGTC AATAACATGA CTAATCGGTC TAATCCTAAT	1140
	GCAATACCGC CATGTGGTGG TGCACCATAT TTAAATGCAT CTAGTAAGAA GCCGAACGT	1200
35	TCCTGTGCTT GTTCTTTAGT AAATCCAAGA ACTTCGAACA TTTTTTCTG TAACTACCA	1260
	TCATGAATTC TGATTGAACC GCCACCTAAT TCATAACCAT TTAATACTAT GTCATAAGCA	1320
	TTTGCCTCAG CTTCTTCTGG CGCAGTGCCA AGCTTAGCAA TATCAGCTTC TTTGGAGAT	1380
40	GTAAATGGAT GATGTGCTGC AACGTAACGT TTCGCATCTT CATCATATTC TAATAATGGC	1440
	CAATCTGTCA CCCATAAGAA GTTTAATTTT GTTTCATCGA TTAAACCTAA TTCTTAGCT	1500
	AATTGACAC GTAATGCACC TAACTTTGT GCAACGACAT TTGGTtGTC TGCAACAAAC	1560
45	ATTACTAAGT CACCAGCTTC AGCACCAGTT AATGTAAGTA ATGTTTCAAC ATTTTCTGTT	1620
	CAAAGAAACG	1630

50 (2) INFORMATION FOR SEQ ID NO: 65:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 732 base pairs

55

(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 65:

	CAATTGGACA TCTTGATGA AAAGGACAAC CTTGCGGCGG ATTACTTGGC GAAGGTAATT	60
10	CTCCTTTTAA TATAATTCTA TTGTTATTAT GTTTATCAAT TTGTGGTATT GATGAAATCA	120
	ACGCTTTTGT ATATGGATGT TTGGGATTTT CATAAATTTT TTTATCAGAT GCGATTTCAA	180
	CTATATGACC TAAATACATA ACTCCAATGA CATCACTTAT ATGTTTTACT AACTTTAAAT	240
15	CATGTGCGAT AAATAAATAG CTTAAGTTAA ATTGTTCTTG TAAATCTTTT AATAAATTCA	300
	GTACTTGAGA TTGAACAGAT ACATCTAATG CACTTACAGG CTCATCAGCA ACAATTAAAC	360
	TCGGACGCAA AGCCAATGCT CTTGCAATTC CCACTCTTTG TCTCTGTCCA CCTGAAAATT	420
20	CATGTGCATA TTtATAATAT GCATCTTCAC TTAGGCCAAC ACATTTTAAT AAATATAGTA	480
	CTTCTTTTTT TATTTCTTCT TTTGGCAATT TTTTATAATT TAAAATAGGT TCTGAAATGA	540
25	TATCTCCAAC CATTTGCATC GGATTCAATG ATGCATACGG ATCTTGAAAT ATCATCTGAT	600
	ATTGTTGTCTG TGATTTTCTG AGTTTTTTTAC CTTGTAATCT TGTTATATCT TCACCATTAA	660
	CAATTATTGA GCCTGAAGTT GCATCTTCAA GCCTGATAAT CACTTTACCT AACGTTGACT	720
30	TACCACAACC CG	732

(2) INFORMATION FOR SEQ ID NO: 66:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 5838 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

35

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 66:

	AATATATTCA TATGTTTCAT CAACAATATT AGCTGCTTTT TGAATTAAAG CAATTTTCGTC	60
45	AGCATCTTTG ACGTCTCTAA TTTTATCTAC AGTATTAGAA ATGCTTATTA ATGATATACG	120
	GCTTTTATTT AATTCAAGGT ATGTATCATA ACTTACATGA TGCCCCCTCAA AACCTACATT	180
	TTCAAAATTT TCTTGGTGTA GCAATTCTTT AATCTCACCA ATAATAGTAG ATTTACGATT	240
50	AATAATTTCA TAATTTGGCG CCTGCTTAGT TGCTTGATCA ATATATCTAA AGTCTGTTAT	300
	CAAATATTGT TTATCTTTAG ATATGATAAG TGCTCCACTG GTACCAGTAA AACCTGATAA	360
	ATATCTTCTA TTGTAATCCG AAAGAATGat AATCGCATCT AAATGTTTTT GTTCTAAAT	420

55

	CAACTTTATA CATTAAAATA ATATCATAAT AAGGATAAAA AATAATAGAT ATTGATTTTA	540
	GGGAGATAGT AATGAAAAAA TTGGTTTCAA TTGTTGGCGC AACATTATTG TTAGCTGGAT	600
5	GTGGATCACA AAATTTAGCA CCATTAGAAG AAAAAACAAC AGATTTAAGA GAAGATAATC	660
	ATCAACTCAA ACTAGATATT CAAGAACTTA ATCAACAAAT TAGTGATTCT AAATCTAAAA	720
	TTAAAGGGCT TGAAAAGGAT AAAGAAAACA GTAAAAAAC TGCATCTAAT AATACGAAAA	780
10	TTAAATTGAT GAATGTTACA TCAACATACT ACGACAAAGT TGCTAAAGCT TTGAAATCCT	840
	ATAACGATAT TGAGAAAGAT GTAAGTAAAA ACAAGGCGA TAAGAATGTT CAATCGAAAT	900
15	TAAATCAAAT TTCTAATGAT ATTCAAAGTG CTCACACTTC ATACAAAGAT GCTATCGATG	960
	GTTTATCACT TAGTGATGAT GATAAAAAAA CGTCTAAAAA TATCGATAAA TTAAACTCTG	1020
	ATTTGAATCA TGCATTTGAT GATATTAATA ATGGCTATCA AAATAAAGAT AAAAAACAAC	1080
20	TTACAAAAGG ACAACAAGCG TTGTCAAAT TAACTTAAA TGCAAATCA TGATAGGAGT	1140
	CTTTTAATGC GTAATATAAT ATTTTATCTT GTACTTATTA TTGCTGCGAT TGGATTAGTA	1200
	ATGAATCTAG ATGCCTTTAT TTTTCAATC GTCAGAATGT TAATCAGCTT TGcgTAaTAG	1260
25	CTGGTATTAT TTATCTGATT TATTATTTCT TCATCTTAAC TGAAGACCAA CGCAAATATC	1320
	GCAAAGCAAT GCgTrAaGTA TAAAAGAAAT CAAAGAAGAA AATAGATAAA AAAACGGAAG	1380
	CACtTGtAGG TAAAATAGTC TACGTGCTTC CATTTTTTAT TCTAAAACT ACTTtCTAAA	1440
30	CATCCATTCA TCTGAACGAT ATTTTTCAGT TAATTCTTCC ACTTCTGCCA AITGAGCTTC	1500
	TGtTAATTCA AGTGGCTTTA ATTCTATATT TAAACCTTTC TTAAACCTT TCTCGAAAGC	1560
	TTCTTCCATT TGAATAATAG TAATGTGTTT ATCTGAAATA TCATTGATGG CAACTGCTTT	1620
35	TTCAACGAAT GCCTCTTTCA TTTTAAATT TAATCTTCA TTTTATAAA TrAACATATC	1680
	AAACAgTTCA TCAATATCAA TATCTTGTA AATCGAACCG TGTGGAGGA TTACGCCCTT	1740
40	TTGTCTCGTT TGAGCACTCC CAGCAATCTT ACGGCCTTCA ACAACTAGCT CATACCAACT	1800
	TGGTGCATCA AAACACACTG AACTTCGAGG TTGTTTTAAT TTTTGACGCT CTTcAGGCGT	1860
	TTTAGGTACC GCAAAATAAG TATCAAATCC TAAGTTTTTA AATCCTTCTA ATAATCCTTG	1920
45	TGAAATCACT CTGTACGCTT CTGTAAGTGT AGAAGGCATA TTCGGATGCG ATTCAGGCAC	1980
	AATCACACTG TAAGTTAACT CTTTATCATG TAGCACCCCA CGGCCACCAG TTTGACGCCT	2040
	TACGAGACCA AAACCTTTCT CTTTAACCTT ATCAATATCA ATTCTTTTTT GTAGCCTTTG	2100
50	GAAATACCCT ATTGATAATG TTGCAGGATT CCATGTGTAA AAACGTATAA CTGGATCAAT	2160
	TTCACCTCTA GAGACAAAAT TTAATAACGC TTCATCCATT GCCATATTAT AATATGGGTC	2220

55

EP 0 786 519 A2

	AAATGTATAA TATTTGATTG GCTAATTAAT CAATTTAACT AAATGAATAA TAATTGCAAT	2340
	TCTTTAGTGA AATATTTTGA TAATTTGACC TAACAGTCTT ATAATTATAT TATCGTTTAA	2400
5	TTAGGGAGGA TGCAAGATGA GTGCTAGTTT GTACATCGCA ATAATTTTAG TTATAGCAAT	2460
	TATTGCTTAT ATGATTGTTT AACAAATTCT TAACAAGCGA GCTGTAAAG AATTAGATCA	2520
	AAATGAATTC CATAATGGGA TTAGAAAAGC TCAAGTCATC GATGTTAGAG AGAAAAGTTGA	2580
10	CTATGACTAC GGTCACATTA ATGGGTCTCG CAATATTCTT ATGACAATGT TCAGGCAACG	2640
	ATTCCAAGGA TTAAGAAAAG ATCAACCGGT ATACTTATGT GATGCCAATG GGATTGCTAG	2700
15	CTATAGAGCC GCTCGTATTT TGAAAAGAA TGGATATACA GATATCTATA TGTTAAAAGG	2760
	CGGCTATAAA AAATGGACTG GAAAAATAAA GTCTAAAAAA TAGTTTTTGT AAATTTAATA	2820
	TACGATTTAA TAAAATCTGA GTGTTAATTG ATCATCAATA ACAATACTCA GATTTTAATT	2880
20	TTTTAACAAA GTCTGTTACT ATATTTCTCT AGCTTCACTG ATCATTAAAC TTAGTTTCAG	2940
	CATAATAAAG AAAGTTCAGC TCATTTTCAA TACGATTCAA TTACCGCAAT CTAAAAAATG	3000
	AAAAGACAAT TTCTATGAAA GAATAATACC AAACCCTAAG AGTTATTACT TCGGTTTAGT	3060
25	TTTCTTGTTT AAATAGAAAT TGTCTTTTTC AATTGATTTT GAAACCATTA TCCTTAAATC	3120
	TTCATACAAA GTTAGAATAA TAATTCTCGG AATATGTGTT TAATACTTTA TTTTTCCTGT	3180
	TTAAGATTTT CAAACTTTAA TATTGGTTTA CGAGCAGCTG TAGCTTCGTC TAATCGATCA	3240
30	ATCACAGTTG TATGTGGTGC TTCTAGCacT TTATCAGGAT CATTTTTAGC TTCITCAGCA	3300
	ATACTAATTA ATGTATCGAT AAAATAATCA AGTGTTCCTT TAGACTCTGT CTCAGTCGGT	3360
35	TCAATCATCA TACCTTCTTC AACATTTAAT GGGAACTATA TTGTTGGTGG ATGTACACCG	3420
	AAATCTAATA ATCGCTTAGC CATGTCTAAA GTACGTACAC CAAATTCTTT TTGACGCACA	3480
	CCACTTAACA CAAACTCGTG TTTACAATAT TGTTTATAAG GTATTTCAA GTGTTTAGAT	3540
40	AAACGTGCTT TAATATAATT CGCATTAGA ACCGCTGCTT CAGAAACCTC TTTAAGTCCA	3600
	GTGCTCCCA TAGTTCGAAT ATACGTATAA GCTCTTAAGT AAATACCAA GTTACCATAA	3660
	AATGGTTTTA CACGTCCGAT AGAATTTTAA ATGTCATTAT CATATTTAAA TTTGTCGCCA	3720
45	TCTTTAATAA CCATTGGCTT TGTAAGTAA CTGCTAGTT CTTTACTAC ACCGACTGGA	3780
	CCTGAACCAG GACCGCCACC ACCATGTGGA CCAGTAAATG TTTTATGCAA GTTTAAATGA	3840
	ACAGCATCAA ATCCCATATC TCCTGGGCGA ACTTTGTCCA TAATAGCGTT TAAATTCGCA	3900
50	CCATCATAAT ATAATAGACC ACCAGCATTA TGGACGATT CACGGATTTT CATAATATTT	3960
	TTTTCGAAAA TACCTAAAGT GTTTGGATTA GTTAACATAA TAGCTGCTGT ATTTTCATTT	4020
55		

EP 0 786 519 A2

	GATTTAAATC CTGCAAATGa AGCTGAGGCT GGaTTCGTAC CATGCGCAGA ATCTGGcACA	4140
	ATGACTTCAT CACGATGACC TTCACCATTA TTCTCATGGT AAGCTTTAAA TATCATCAAT	4200
5	GCAGTCCATT CACCATGTGC GCCAGCAGCT GGTGTGAATG TCACCTCATC CATACCAGTA	4260
	ATTTCTTTTA ATTCTTCTTG CAAACTATAA ATAATTTCTA ATGAACCTTG AACTTGATCT	4320
	TCATCTTGTA ATGGATGTGA TTCACTAAAT CCTGGTATTC TAGCAACCTT TTCATTAATT	4380
10	TTAGGGTTAT ACTTCATCGT ACATGAACCC AATGGATAAA ATCCGTTGTC TACACCGAAA	4440
	TTTTTATTG AAAGTTCAGT ATAATGACGT ACTAAGTCTA GTTCAGCAAC TTCAGGAAAC	4500
	TCCGCTTTGT TTTTACGAAT AAATTTATCA TCTAACAATG ACTCAACAGA ATTTGTTTTA	4560
15	ATATCACTTT TTGGTAATGA ATATGCATAT CTGCCTTCAC GAGATCTTTC AAAAATTAAT	4620
	GGACTTGATT TACTAGTCAT TTAACTCACC AGCCTTTTCT ACAAATGTAT CGATTTCATC	4680
20	TTTTGTCTT AATTCAGTTA CAGCTATTAA CATGTGATT TTAAGTCGT CTGAAACAAC	4740
	ACCTAAATCA AAACCACCGA TAATATTGTA CTTCACTAAT TCCTCGTTAA CTTGTTGAAT	4800
	TGGTTTGTC AATTGACTA CAAACTCATT GmnAAGnTGT ACCATCTAAT ACTTCAAAAC	4860
25	CTTTTTTAAT AAATTGTTGT TTAGCATAGT TAGCATGTTT TATATTTTGA ACTGCAATAT	4920
	CATAGATACC TTGTTTACCA AGTGCTGACA TTGCAATTGA TGaCGcTAAA GCATTTAATG	4980
	CTTGGTTAGA ACAAATATTA GATGTCGCTT TATCGCGTCG AATATGTTGT TCACGTGCTT	5040
30	GTAATGTAA TACAAAGCCA CGATTACCTT CATCATCTTG TGTTTGACCG ACTAATCTAC	5100
	CTGGCACTTT ACGCATTAACT TTTTTCGTCG TTGCAAAATA TCCACAATGT GGCCCACCGA	5160
	ATTGAGCAGG AATTCCGAAT GGCTGAGTAT CACCTACAAC AATATCTGCA CCAAATGAAC	5220
35	CTGGAGGTGT AAGTAATCCC AATGCTAATG GATTTGCATA TACGATAAAT AATGCTTTTT	5280
	TATCTFCAAT AAAGCTATGA ATCTTTTCAA GATCTTCAAT TGAACCGTAA AAGTTTGGAT	5340
40	ATTGTAAGTGC AACAGCTGCT GTTTCATCAT CCACTGCTGC TTCTAATTTT TTCAAATCTG	5400
	TAACAGTGCC ATCTAAATCG ATTTCCACTA CTTCGAATTC CTTACGCGTC TTAGCATAAG	5460
	TATGAAGTAC TTGTAATGCT TGATAATGTA AACCTTTTGA GACTACAATT TTATTTTTCT	5520
45	TTGTTTGACT AAATGCTAAG ATACATGCTT CAGCAAAGCT AGTCATCCCA TCATACATAG	5580
	AAGAATTTGC TACATCCATA TCTGTAAAT CACAAATTAA AGTTTGAAC TCAAAAATGG	5640
	CTTGTAATTC ACCTTGAGAA ATTTCCGGTT GATATGGCGT ATATGCTGTG TAAAATTCTG	5700
50	ATCTTGAAAT CATAGCATCC ACAACTGATG GCGCGTAATG ATCATAAACA CCAGCACCCA	5760
	rAAATGATGT ATGCGTTTCT TTAGTGATAT tCTTGCTkGC AATGGGGATT TAAACnTCTA	5820

55

(2) INFORMATION FOR SEQ ID NO: 67:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18355 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 67:

ATnATAATTG GCTTTGCTAA TAATTACTTC CCTGAATTAC aAGTATTAGC AAACGAAATA	60
AAATCTGATA TGGCTAGTTC ATTAAAACAA TGATATTTTT ATTTAAATTT TTaAAGCTTT	120
GTACGAAATT GTACAAAGCT TTTTGGTGC GTATTGTATG GGCAACAACCT TGACGATGAA	180
AATCCGTTAC AGGATTGGTA ATAGGAAATG TTAGCGAAAG ACAAGGGTAT CCATTGTAGA	240
TTAACAAAAG GACGTTTCCA CAAGTGTGGG TTATTCTCAC TAAAGCAATA CGCAGAGACA	300
ACTTACGTAA AATTTTGAAC TGA CTAGTAAGC GGAACCTCTA CTCAATTATT GATAAAAATT	360
TTCAAAAAGA CTTGAATGTG CTGAGAATAC GAAGTTTATG GAAGGATTAT CAAAATATAA	420
ATGTGCATTC ATTTACAACC TTTATTGACA ATGATTCTCA ACTAATATAG TATATAATCA	480
AATCGTAATA GTTACGATTT GTTTCTGCA ACTTTTTTGA AGTTTTAGTT GAGGTGAAAA	540
CAATAAAGC ATCTAAGTGA ATGTAGTTAA CGGACAACCTG CATTGCTTG TAGAGCCACA	600
AGAAGCAACT TTAAATAAGG TTTACGGTTG CATTTTGATA CAACAACCGA TTAATAAGTC	660
ATGCTTTCCA CTTTGCGGGT TAGCATGACT TACCTAATAG ATAGAGCTAT TAGGTTGAGC	720
TTCTAAAAAA TTACAGTTTT AGAGGAATAC AGTTGcTTGc tTCGCAACAA CTGCATAAGA	780
GCCATGGTTT TCGCTTTTGC GAATTAGCAT GACTTACCTA CTAGATAGAG CTATTAGGTT	840
CATCTTCTAA AAAATTACAG GTTTAGAGGA ATACAGTTGT TTGcTTGCA ACAACTGCAT	900
AAGAGCCTCT AGTAATTAAT ATTACAGAGG CTCTAAAAAT ACATCTAAAG GAGTGTGCTA	960
TGAATCGGCA GGTATAGAA TTTTCTAAGT ATAATCCTTC GGGGAATATG ACGATACTTG	1020
TTCAATCAAA ACATGATGCT AGTGAATATG CATCTATCGC CAATCAGTTG ATGGCCGCAA	1080
CACATGTATG CTGTGAACAG GTAGGCTTTA TAGrATCAAC ACAAATGAT GATGGTAATG	1140
ATTTTCACTT AGTTATGAGC GGTAATGAAT TTTGCGGTAA TCGGACGATG TCATATATAC	1200
ATCATTTGCA GGAAAGTCAT TTGCTTAAAG ACCAACAGTT TAAGGTGAAG GTGTCTGGCT	1260
GTTCGGATTT AGTGCAATGC GCAATTCATG ATTGCCAATA CTATGAAGTT CAAATGCCAC	1320
AAGCCCATCG TGTGTGCCA ACAACAATTA ATATGGGTAA TCATTCATGG AAAGCAATAG	1380

	TTCAACATTT	GGTTGAAGCG	TTTGTGCGTG	AgcAACAAATG	GAGTCACAAA	TATAAAACAG	1500
	TAGGTATGAT	GCTTTTTGAT	GAACAACGTC	AATTTTTTACA	GCCATTAATC	TATATACCAG	1560
5	AAATTCAAAG	TTTAATTTGG	GAAAATAGCT	GTGGTTCTGG	TACAgCATCA	ATTGGGGTTT	1620
	TTAATAATTA	TCAACGTAAT	GACGCATGCA	AAGATTTTAC	AGTACATCAG	CCAGGGGGCA	1680
	GTATTTTAGT	GACATCAAAG	CGATGTCATC	AATTGGGATA	TCAAACCTCA	ATTAAAGGAC	1740
10	AGGTTACAAC	TGTAGCTACA	GGaAAAGCAT	ATATAGAATA	AGGAGCCTAC	AATGAATAAC	1800
	TTTAATAATG	AAATCAAATT	GATATTACAA	CAATATTTAG	AAAAGTTTGA	AGCGCATTAC	1860
	GAGCGTGTAT	TACAAGACGA	TCAATATATC	GAAGCATTAG	AAACATTGAT	GGATGACTAT	1920
15	AGTGAATTTA	TTTTAAATCC	TATTTATGAA	CAACAATTTA	ATGCTTGGCG	TGACGTTGAA	1980
	GAAAAAGCAC	AATTaATAAA	ATCACTGCAA	TATATTACAG	CGCAGTGTGT	TAAACAAGTG	2040
20	GAAGTCATTA	GAGCGAGACG	TCTATTAGAC	GGACAGGCGT	CTACCACAGG	TTACTTTGAC	2100
	AATATAGAAC	ATGTATTGTA	TGAAGAGTTT	GGACAAATGTA	GTATAGCTAG	CAATGACAAA	2160
	TTATTGTTAG	TTGGTTCAGG	TGCATATCCA	ATGACGTTAA	TTCAAGTAGC	AAAAGAAACA	2220
25	GGTGCTTCAG	TTATCGGTAT	TGATATTGAT	CCACAAGCCG	TTGACCTAGG	GCGCAGAATC	2280
	GTTAACGTCT	TAGCACCAAA	TGAAGATATA	ACAATTACGG	ATCAAAAGGT	ATCTGAACTT	2340
	AAAGATATCA	AAGATGTGAC	GCATATCATA	TTCAGCTCGA	CAATTCCTTT	AAAGTACAGC	2400
30	ATTTTAGAAG	AATTATATGA	TTTAACAAAT	GAAAATGTGCG	TAGTTGCAAT	GCGCTTTGGT	2460
	GATGGCATCA	AAGCAATATT	TAATTATCCG	TCACAAGAAA	CAGCGGAAGA	TAAGTGGCAA	2520
	TGTGTGAATA	AACATATGAG	ACCACAGCAA	ATTTTGTGATA	TAGCACTTTA	TAAAAAAGCA	2580
35	GCTATAAAGG	TAGGTATTAC	GGATGTCTAA	ATTATTAATG	ATAGGCACTG	GTCCgGTGCG	2640
	AATGCAATTA	GCGAATATTT	GCTATTTAAA	ATCAGATTAT	GAGATTGATA	TGGTTGGACG	2700
40	TGCCTCAACA	TCAGAAAAAT	CAAAACGCTT	ATATCAAGCG	TATAAAAAAG	AGAAACAATT	2760
	TGAAGTCAAA	ATACAAAACG	AGGCGCATCA	ACATCTGGAA	GGTAAGTTTG	AAATTAATCG	2820
	TTTGTATAAA	GATGTTAAAA	ACGTTAAGGG	TGAATACGAA	ACGGTTGTCA	TGGCATGCAC	2880
45	AGCAGATGCT	TATTATGACA	CACTACAGCA	ATTGTCGTTA	GAAACTTTGC	AAAGTGTCAA	2940
	ACATGTCATT	TTAATATCAC	CGACATTGG	TTGCGAAATG	ATTGTCGAAC	AATTTATGTC	3000
	TAAATTTAAT	AAAGATATCG	AAGTGATTTC	ATTCTCAACT	TATCTTGGCG	ATACACGTAT	3060
50	TGTTGATAAA	GAAGCGCCTA	ATCATGTGTT	GACAACAGGT	GTAAAAAAGA	AATTGTACAT	3120
	GGGATCGACA	CATTCAAAC	CAACAATGTG	TCAACGAATC	TCTGCTTTAG	CTGAGCAATT	3180
55							

EP 0 786 519 A2

	TTATGTGCAC CCACCACTAT TTATGAATGA CTTTTCATTG AAAGCCATTT TCGAAGGAAC	3300
	AGATGTACCG GTTTATGTGT ATAAGTTATT TCCTGAAGGA CCGATAACGA TGACACTAAT	3360
5	CCGTGAAATG CGTTTAATGT GGAAGGAAAT GATGGTTATT TTACAAGCAT TTAGAGTGCC	3420
	GTCAGTCAAC CTGCTTCAAT TTATGGTGAA GGAAAATTAT CCAGTACGTC CTGAAACTTT	3480
	GGATGAAGGT GATATTGAGC ATTTGCGAAT CTTGCCAGAT ATCTTACAAG AATATCTGCT	3540
10	TTATGTAAGA TATACCGCAA TCCTCATTGA TCCATTTTCA CAGCCAGACG AAAACGGACA	3600
	TTACTTTGAT TTTTCAGCTG TACCATTTAA GCAAGTCTAT AAAAATGAAC AGGATGTTGT	3660
	TCAAATTCCA AGAATGCCAA GTGAAGATTA TTACAGAACG GCGATGATTC AGCATATTGG	3720
15	GAAAATGCTA GGTATCAAAA CGCCAATGAT TGATCAGTTC CTAACCTCGCT ATGAAGCAAG	3780
	TTGCCAGGCG TACAAGGATA TGCATCAAGA TCAACACTTA TCTTCTCAAT TTAATACAAA	3840
20	TCTATTTGAA GGAGATAAAG CACTCGTCAC AAAATTTTTG GAAATCAATA GAACGCTTTC	3900
	ATAATAAGGG TTTGAAGTTT TATAATAGAA AAAAATTATT GAATTATGTT TGACATTTAC	3960
	ATAAAAAATA GCAAATAATT GAGAAAAATA ATCATTACGA TTTGATTAAAG TAATGCAACT	4020
25	TATCAATTTA GAAAGAGGAA AAGCAAATGA GAAAACTAAC TAAAATGAGT GCAATGTTAC	4080
	TTGCATCAGG GCTAATTTTA ACTGGTTGTG GCGGTAATAA AGGTTTAGAG GAGAAAAAAG	4140
	AAAACAAGCA ATTAACGTAT ACGACGGTTA AAGATATCGG TGATATGAAT CCGCATGTTT	4200
30	ACGGTGGATC AATGTCTGCT GAAAGTATGA TATACGAGCC GCTTGACGT AACACGAAAG	4260
	ATGGTATTAA GCCTTTACTA GCTAAAAAGT GGGATGTGTC TGAAGATGGG AAGACATACA	4320
35	CGTTCCATTT GAGAGATGAC GTTAAATTCC ATGATGGTAC GCCATTTGca TGctGACGCA	4380
	GTTAAGAAAA ATATTGACGC AgTTCAAGAA AACAAAAAAT TGCATTCTTG GTTAAAGATT	4440
	TCGACATTAA TTGACAATGT TAAAGTTAAA GATAAGTACA CGGTTGAATT GAATTTGAAA	4500
40	GAAGCATATC AACCTGCATT GGCTGAATTA GCGATGCCTC GTCCATATGT ATTTGTGTCT	4560
	CCAAAAGACT TTA AAAACGG TACAACAAAA GATGGCGTTA AAAAGTTCGA TGGTACTGGT	4620
	CCATTTAAAT TAGGTGAACA CAAAAAGAT GAGTCTGCAG ACTTTAACAA AAATGATCAA	4680
45	TACTGGGGCG AAAAGTCTAA ACTTAACAAA GTACAAGCAA AAGTAATGCC TGCTGGTGAA	4740
	ACAGCATTCC TATCAATGAA AAAAGGTGAA ACGAACTTTG CCTTCACAGA TGATAGAGGT	4800
	ACAGATAGCT TAGACAAAGA CTCTTTAAAA CAATTGAAAG ATACAGGTGA CTATCAAGTT	4860
50	AAGCGTAGTC AACCTATGAA TACGAAAATG TTAGTTGTCA ATTCTGGTAA AAAAGATAAC	4920
	GCTGTGAGTG ACAAACAGT CAGACAAGCG ATTGGTCATA TGGTAAACAG AGATAAAATT	4980

55

EP 0 786 519 A2

	ACAGACATTA	ATTTCGATAT	GCCAACACGT	AAGTATGACC	TTAAAAAAGC	AGAATCATT	5100
	TTAGATGAAG	CTGGTTGGAA	GAAAGGTAAA	GACAGCGATG	TTCGTCAAAA	AGATGGTAAA	5160
5	AACCTTGAAA	TGGCAATGTA	CTATGACAAA	GGTTCTTCAA	GTCAAAAAGA	ACAAGCAGAA	5220
	TACTTACAAG	CAGAATTTAA	GAAAATGGGT	ATTAAGTTAA	ACATCAATGG	CGAAACATCA	5280
	GATAAAATTG	CTGAACGTCG	TACTTCTGGT	GATTATGACT	TAATGTTCAA	CCAAACTTGG	5340
10	GGATTATTGT	ACGATCCACA	AAGTACTATT	GCAGCATTTA	AAGAGAAAAA	TGGTTATGAA	5400
	AGTGCAACAT	CAGGCATTGA	GAACAAAGAT	AAAATATACA	ACAGCATTGA	TGACGCATTT	5460
	AAAATCCAAA	ACGGTAAAGA	GCGTTCAGAC	GCTTATAAAA	ACATTTTGAA	ACAAATTGAT	5520
15	GATGAAGGTA	TCTTTATCCC	TATTTTCACAC	GGTAGTATGA	CAGTTGTTGC	ACCaAAAAGAT	5580
	TTAGAAAAAG	TATCATTAC	ACAATCACAG	TATGAATTAC	CATTCAATGA	AATGCAGTAT	5640
20	AAATAAAGGA	GCAATTAGAT	GTTCAAATTT	ATCTTAAAC	GTATTGCGCT	CATGTTTCCA	5700
	TTGATGATTG	TAGTAAGTTT	TATGACATTT	CTATTGACGT	ATATTACAAA	TGAAATCCA	5760
	GCTGTGACAA	TTTACATGC	ACAAGGGACG	CCAAATGTAA	CACCAGAGTT	GATTGCAGAA	5820
25	ACGAATGAGA	AGTACGGTTT	CAATGATCCA	TTATTAATTC	AATATAAAAA	TTGGTTACTT	5880
	GAAGCGATGC	AATTTAATTT	TGGTACAAGC	TACATTACAG	GTGACCCAGT	TGCTGAACGT	5940
	ATTGGTCCAG	CATTTATGAA	TACATTGAAA	TTAACAATAA	TTCAAGTGT	TATGGTGATG	6000
30	ATTACATCAA	TTATTTTAGG	TGTAGTTAGT	GCATTAAAAA	GAGGAAAGTT	CACTGATCGT	6060
	GCGATACGTT	CAGTGGCTTT	CTTCTAACT	GCATTACCAT	CATATTGGAT	AGCTTCAATA	6120
	CTTATTATTT	ACGTTTCAGT	GAAGTTAAAC	ATATTGCCGA	CTTCTGGATT	AACAGGTCCA	6180
35	GAAAGTTACA	TATTGCCAGT	GATCGTTATT	ACGATTGCCT	ATGCTGGTAT	TTACTTTAGA	6240
	AATGTTAGAC	GCTCGATGGT	GGAACAATTA	AATGAAGATT	ATGTACTTTA	TTTAAGAGCA	6300
	AGCGGTGTGA	AATCTATCAC	ATTAATGTTG	CATGTGTTGC	GTAATGCTTT	ACAAGTTGCG	6360
40	GTATCAATCT	TTGTATGTC	TATACCAATG	ATAATGGGTG	GACTAGTTGT	TATCGAGTAT	6420
	ATCTTTGCAT	GGCCTGGACT	AGGTCAATTA	AGTTTAAAAG	CAATACTTGA	ACACGATTTT	6480
45	CCAGTCATTC	AAGCATATGT	ATTAATTGTA	GCGGTATTAT	TTATTGTATT	TAATACATTA	6540
	GCAGATATCA	TTAATGCGCT	ATTAAATCCA	AGATTAAGGG	aGGGCGCACG	ATGATAATTT	6600
	TAAAmCGATT	ATTmCArGwT	AAAGGTGCAG	TAATTGCTTT	AGGCATTATT	GTATTATATG	6660
50	TCTTTTTAGG	ATTAGCAGCA	CCACTTGTGA	CATTTTATGA	TCCTAACCAT	ATCGATACAG	6720
	CAAACAAATT	TGCTGGCATG	AGTTTTCAAC	ATCTACTAGG	TACTGACCAT	TTAGGTAGAG	6780

55

EP 0 786 519 A2

	TATTTGTTTC	TGTA	CTTATT	GGATCTATTT	TAGGATTCTT	ATCAGGATAT	TTCCAAGGGT	6900
	TTGTTGACGC	CTTAATCATG	CGTGCGTGTG	ATGTTATGTT	GGCATTCCCA	AGTTATGTTG		6960
5	TAACGTTAGC	ATTAATTGCA	TTGTTTGGAA	TGGGTGCCGA	AAATATTATC	ATGGCATTTA		7020
	TTTTGACGCG	TTGGGCATGG	TTCTGTCGTG	TTATACGTAC	AAGTGTTATG	CAGTACACTG		7080
	CTTCTGACCA	TGTAAGATTT	GCTAAAACAA	TCGGTATGAA	TGATATGAAA	ATTATTCACA		7140
10	AACATATTAT	GCCATTAACA	TTAGCAGATA	TTGCTATCAT	CTCTAGTAGC	TCGATGTGTT		7200
	CAATGATCTT	GCAAATATCT	GGCTTTTCAT	TTTTAGGATT	AGGTGTCAAA	GCGCCTACTG		7260
	CAGAGTGGGG	CATGATGCTT	AACGAaGCTA	GAAAAGTGAT	GTTTACACAT	CCTGAAATGA		7320
15	TGTTTGCGCC	AGGTATTGCC	ATAGTGATTA	TAGTGATGGC	ATTTAACTTC	TTATCCGATG		7380
	CTTTACAAAT	TGCTATTGAT	CCCCGCATCT	CTTCTAAAGA	TAAACTTCGT	TCTGTGAAAA		7440
	AAGGAGTGGT	GCAATCATGA	CATTGTTAAC	AGTTAAACAT	TTGACGATTA	CAGATACCTG		7500
20	GACAGATCAA	CCACTCGTGA	GTGATGTGAA	TTTTACATTA	ACTAAGGGTG	AAaCTTTAGG		7560
	CGTTATTGGA	GAAAGTGGA	GTGGTAAATC	AATCACTTGT	AAATCGATTA	TTGGTTTGAA		7620
25	TCCCGAACGA	CTCGGGGTGA	CAGGTGAAAT	TATCTTTGAT	GGTACatCAA	TGTTGTCAAT		7680
	ATCTGAATCG	CAATTGAAAA	AGTACCGTGG	TAAAGACATT	GCGATGGTCA	TGCAACAAGG		7740
	TAGTCGTGCC	TTTGACCCAT	CAACTACTGT	CGGTAAACAA	ATGTTTGAGA	CTATGAAAGT		7800
30	ACATACGTCA	ATGTCTACAC	AAGAAATTGA	AAAGACATTG	ATTGAATATA	TGGATTATTT		7860
	AAGTTTGAAA	GATCCTAAAC	GTATATTAAA	ATCATACCCT	TACATGTTAT	CAGGAGGAAT		7920
	GTTACAGCGA	TTGATGATTG	CTTTAGCGTT	AgcTTTgAAA	CCAAAGTTAA	TCATTGCTGA		7980
35	TGAGCCGACA	ACGGCTTTAG	ATACAATTAC	ACAATATGAT	GTACTGGAAG	CATTTATAGA		8040
	TATTAAAAAA	CACCTTTGACT	GTGCGATGAT	TTTCATTTCA	CATGATTTAA	CGGTTATTAA		8100
	CAAGATTGCA	GACCGTGTG	TTGTGATGAA	AAATGGTCAG	CTTATTGAAC	AAGGGACACG		8160
40	TGAATCAGTC	TTGCATCATC	CAGAACATGT	TTATACGArt	ATTktATTAT	CAACGAAGAA		8220
	GAAGATTAAT	GATCATTTTA	AACATGTGAT	GAGGGGTGAT	GTACATGATT	AAAATTAAAG		8280
45	ATGTTGAAAA	GTCATATCAA	AGCGCACATG	TTTTTAAGCG	TCGTGGAACA	CCTATCGTGA		8340
	AAGGTGTGTC	ATTTGAGTGT	CCAATCGGTG	CGACGATTGC	GATTATCGGA	GAAAGTGGA		8400
	GCGGTAAATC	GACGTTGAGT	CktATGATAT	TAGGTATTGA	GAAACCGGAT	AAAGGTTGTG		8460
50	TAACTTAA	TGATCAACCG	ATGCATAAGA	AGAAAGTGAG	ACGTCATCAA	ATTGGTGCTG		8520
	TATTTCAAGA	TTATACGTCA	TCATTACATC	CATTTCAGAC	TGTTAGAGAA	ATCTTATTTG		8580

55

EP 0 786 519 A2

	TGTTGGAAGA AGTCGGTCTA TCTAAGGCAT ACATGGATAA ATATCCTAAT ATGTTATCAG	8700
	GTGGAGAGGC GCAACGTGTT GCGATTGCGC GTGCAATATG TATTAACCCT AAATATATT	8760
5	TGTTTGATGA AGCCATTAGT TCACTCGACA TGTCATTCA AACACAAATA TTAGATTAT	8820
	TGATTCATTT ACGTGAAACG CGTCAGTTGA GTTATATTTT TATCACACAT GATATTCAAG	8880
	CTGCCACGTA TTTATGTGAT CAATTAATTA TTTTAAAAA CGGAAAAATA GAAGAACAAA	8940
10	TTCCGACAAG CGCATTGCAT AAAAGTGACA ATGCTTATAC AAGAGAATTA ATAGAAAAAC	9000
	AACTATCAIT CTAAGGAGTG AGATAATGAA AGGTGCAATG GCTTGGCCCT TTTTGAGATT	9060
	ATATATATTA ACATTGATGT TCTTTAGTGC CAATGCAATC TTAAACGTGT TTATACCTTT	9120
15	ACGAGGGCAT GATTTAGGCG CAACGAATAC GGTATCGGT ATCGTTATGG GGGCATACAT	9180
	GTTAACAGCA ATGGTATTTC GACCATGGGC AGGACAAATT ATTGCTCGTG TCGGTCCCAT	9240
	TAAAGTATTA AGAATTATTT TGATTATCAA TGCCATAGCT TTAATTATTT ATGGTTTTAC	9300
20	TGGCTTAGAA GGTATTTTCG TAGCACGTGT TATGCAAGGT GTGTGTACGG CATTCTTTTC	9360
	TATGTCTTTA CAGCTAGGTA TTATTGATGC ATTACCAGAG GAACATCGTT CTGAAGGTGT	9420
25	ATCATTGTAC TCGCTATTTT CAACGATTCC AAACCTAATC GGACCATTAG TTGCCGTAGG	9480
	TATTTGGAAT GCAAATAATA TTCACTATT TGCAATTGTC ATTATCTTTA TCGCATTAAAC	9540
	AACAACATTC TTTGtATCG CGTGACCTTT GCTGAACAGG AACCCGATAC GTCAGATAAG	9600
30	ATTGAAAAA TGCCGTTTAA CGCTGTAAC TTTTTTGCGC AATTTTTCAA AAATAAAGAG	9660
	TTGTTGAACA GTGGTATTAT CATGATTGTT GCATCGATTG TATTTGGTGC AGTTAGTACA	9720
	TTTGTACCGT TATACACAGT GAGTTTAGGA TTCGCGAATG CGGGAATCTT TTTGACAATA	9780
35	CAGGCCATCG CAGTTGTTGC GGCAAGATTT TACTTAAGGA AATACATTCC GTCAGATGGT	9840
	ATGTGGCATC CTAAATATAT GGTATCTGTA CTATCATTAT TAGTAATCGC GTCATTGTGA	9900
	GTGGCATTG GTCCGCAAGT AGGTGCAATT ATTTTCTATG GTAGTGCGAT ATTAATAGGA	9960
40	ATGACGCAAG CAATGGTGTA CCCAACATTA ACATCATACT TAAGCTTCGT CTTACCAAAA	10020
	GTAGGTCGTA ATATGTTGTT AGGTTTATTT ATTGCCTGTG CAGACTTAGG TATATCGTTA	10080
	GGTGGCGCAT TGATGGGACC TATTTCCGAT TTAGTAGGAT TTAAATGGAT GTATCTAATT	10140
45	TGTGGTATGT TAGTCATTGT AATAATGATT ATGAGTTTCT TGAAAAAGCC AACACCAAGT	10200
	CCAGCGAGTA GTCTTTAATG AAGTGAATTA AAGCATATTA AGTTAATGAA TATTTAAATT	10260
50	TTAAAAGGTA TATTGaGCAT GGCGATTCAT GTGCTTCATG CTAGGACATG AAACATTCTA	10320
	TATGGCTCGT TTTTAGAACG ACAtATATCT AAATAAAGCA CGCTTAaAG TGAGTTTGA	10380

55

EP 0 786 519 A2

TTACATGAAA ATATGCAAAA CGAGTATAAC TGCTAATTGA TAGAAATAGC TCACCATAAA 10500
 ATTACGGTAT GATTTTAAAT ATAAGTAAGT CGCACTACCT GCTAGTATCA ATGCTGGAAT 10560
 5 GAATTCACAC CATGTATTAA TGTATGGATA GTAGAACAGA GTTCAAGGA TAATGGACAA 10620
 TACTATTGTA ATCTTTAAAG GTATTAATCT GCTTAATTCT TGAATTAAAA TATGACGGAA 10680
 AATAAGTTGA CAAATCAAAG TATTTAATAT AATGGTTAAC GAAATATAG CTATTAACT 10740
 10 GATGGAaCCA TACCCTTTAA TGAGCGGGTA AATGTCAAAG ACAGTAAAGG AATCTACATT 10800
 TAGTGCGAAA ATATTGAAAT GATTTAAAAG TAAAAAGAGT ACGACACTTA GTGTAAATGA 10860
 TATAAGAATA TGCCATTTAT ATTTAGCACT AGCAACGATT TCGAACGTA TCATTGGAAT 10920
 15 AAACGCATCT TCATGCATCA GACGAAAAAT AGCTAGTGAA ATAATACTG CGAGTAAATA 10980
 GCTAATGTTT ATTGAAATAG GAAAAGAGAA ACCCCACGGA GCTTGTGAG TGAATACAGC 11040
 TACTAACCCA AAAGTTAAAA AGACGATAAT GATCGGCAAG ATGTTAACCA AAAATATGTA 11100
 20 AAGGAAAATA AATCCAATAT CACGTTTGAA AAAACGCGAT TGTTCCGTAG CGTATCTTC 11160
 TTCTATGTAA TGTTTATTG TATTTGACAT AGTATACCTC TTAAATAGTT GTATTATATA 11220
 25 GATACTTTAG CACATATTAC TTTGTATTGT ATGTTTATA CATTAAAATT TAAAATGAAA 11280
 AACATATCAT AAAATTGTTT TATAAAATGA AGCGCTTCCA TTGTGTTTG TTTTGTAAGG 11340
 TGTATCATAA ATATTGAATT GAAATTTGG GGGGAGGTAT TGTAATGACG TTTCTTACAG 11400
 30 TCATGCAATT TATAGTTAAC ATTATCGTTG TAGGATTCAT GCTTACGTT ATTGTTATCG 11460
 GGCTTATTG GTTAATTAAA GATAAAAGAC AATCACAACA TAGTGATTA AGGAATTATC 11520
 CTTTACTAGC ACGTATTAGA TATATTCAG AAAAAATGGG ACCGGAATTA CGTCAGTATT 11580
 35 TATTTTCTGG GGATAATGAA GGGAAACCTT TTTCACGTAA TGATTATAAA AATATCGTTT 11640
 TGGCTGGAAA ATATAACTCT CGTATGACCA GCTTCGGTAC TACTAAAGAT TATCAAGACG 11700
 GCTTTTACAT ACAGAACACA ATGTTTCCGA TGCAACGTAA TGAGATTCA GTAGATAATA 11760
 40 CAACATTGTT ATCAACATTC ATTTATAAAA TCGCGAATGA GCGTTTATT AGTCGTGAAG 11820
 AATATCGTGT GCCGACAAAG ATTGATCCGT ATTACTTAAG TGATGACCAT GCAATAAAAT 11880
 TAGGTGAACA TTAAAACAT CCATTTATTT TAAAACGTAT CGTAGGACAA TCTGGTATGA 11940
 GTTATGGCGC TTTAGGAAAA AATGCCATTA CAGCTTTATC TAAAGGTCTA GCTAAAGCGG 12000
 GCACTTGGAT GAATACAGGT GAAGGTGGCT TATCAGAATA TCATTTAAAA GGTAATGGGG 12060
 50 ATATCATTTT CCAAATTGGT CCCGGTTTAT TTGGTGTTTCG TGATAAAGAA GGTAATTTTA 12120
 GTGAAGGTTT ATTTAAAGAG GTTGCACAGT TATCTAACGT ACGCGCATTT GAGCTGAAGT 12180

55

	TTGCTAAAAT CCGAAATGTT GAACCTTATA AAACAATCAA TTCACCTAAC CGTTACGAAT	12300
	TTATTCATAA TGCTGAAGAT TTGATTTCGTT TCGTCGATCA GTTGACAGCAA TTAGGTCAAA	12360
5	AACCAGTAGG ATTCAAAATT GTAGTAAGCA AAGTTTCAGA AATTGAAACA CTTGTACGTA	12420
	CGATGGTGGA ACTAGATAAG TATCCAAGCT TTATTACGAT TGATGGTGGT GAAGGTGGTA	12480
	CTGGTGCAAC ATTCGAAGAA TTACAAGATG GTGTTGGCTT ACCGCTAITT ACAGCTCTAC	12540
10	CTATTGTGTC TGGCATGTTA GAAAAATATG GTATTTCGAGA TAAAGTGAAA TTGGCGGCAT	12600
	CTGGTAAGTT AGTGACACCA GATAAAATTG CGATTGCACT AGGTTTAGGT GCAGATTTTG	12660
15	TAAATATCGC ACGTGGGATG ATGATTAGTG TCGGTTGTAT AATGAGTCAA CAATGTCACA	12720
	TGAATACGTG TCCTGTAGGT GTTGCAACGA CAGATGCGAA GAAAGAAAAA GCATTGATTG	12780
	TTGGAGAAAA GCAATATCGT GTCACAACT ATGTAACAAG TTTGCATGAA GGCTTATTCA	12840
20	ATATTGCAGC AGCTGTTGGC GTATCCAGTC CTACAGAAAT TACTGCTGAT CATATTGTAT	12900
	ATCGAAAAGT CGATGGTGAG TTACAAACGA TACATGATTA TAAATTAAAA CTCATTAGTT	12960
	AACCTAATTA TTTCGGGAAA TTGAAAGCAG CGGATTTTAG CGTTACTGCA AATAATTTTA	13020
25	TATTAGTAGT GGATGCTGGT CACACAAGAA CTTCAAATAT TAAAGCCCTC AGAATATGAA	13080
	TTAAGGTTTG TAACCTTAGT CTTATCTGAG GGCATTTTTA AGTTATAAAC TATTTGTCGT	13140
	CCATTTTATC TTTTCTTTT AAACCTCTGT GCTTTAATTG CTTTTCAAGT TTTTCAAAAC	13200
30	TAATATCTTT ATTTTCTTTA GTCGAAACAC CAAGACGTTT ATTTAATTTT TTCATGTCAA	13260
	CTTCTGTGTA ATCTATGTCT AAGTGyTCAA TTGCTTTTTT ATCTTTATAG TCTACTTTGT	13320
	ATTTTACGCC TTTAAGGTCT TTGAAAATAC TTTCAGATTG GCGAATAAC TTTTGGCTT	13380
35	CGTCTTTATC CATACTAGA TCGTCATATT TAATTGTGTT GATTGTAGAC TGTTTTAAAA	13440
	CTTCTATCATC TTTATATGTG ATAGAAGTTA GTACATGTTT ACCACTAACA TCACCTCAT	13500
	ATGTTTTGGT TTGTTCTTTA CCACAAGCTG ATAATGCAAT GATACAACT AATGCTACTA	13560
40	CAATTAATGA ACATAATTTT TTCAAAGTCA GTCGCCTTCT TTCGATATTT GTATTATAAA	13620
	GAAATTATAA CATTTACTAA AAAATGATGT TATTCAAAAA TTTAAATTTT GTCATTTTTT	13680
45	TTGAAGATAT GAGTTTTTTT AAGCGGATTC CTCACAAAAT TTTAAAAATA TTTAAGCCTK	13740
	AAAATGATAA AGCGkTAGGG AACGTTTTTC TGAAAGTTAG TGATACAATA GTTTTAAGTT	13800
	GAAATACAGG AGGATGAATA ACATGAATCA GTCAGTCAA TTAATAAAC ATTTAACAGA	13860
50	TGTAAACGGC ATTGCTGGTT ATGAAATGCA AGTTAAAGAA GCAATGCGTa ACTATATAGA	13920
	GCCTGTCAGT GATCAAAATTA TTGAAGATAA CTTGGGTGGC ATTTTTGGAA AGAAAAATGC	13980

55

EP 0 786 519 A2

AACAAAGATT GATAAACATG GTTTTATTTC ATTTACGCCA kTgGTGGATG GTGGAATCAA 14100
 GTCATGCTAT CTCAAAAAGT AACGATTACA ACAGATTTCGG GCAAAGAAAT TAGAGGTATC 14160
 5 ATCGGTTCTA AACCGCCACA TGTCTTAACG CCTGAAGAAC GTAAAAAGCC AATGGAAATC 14220
 AAAAAATATGT TTATAGATAT TGGTGTTAGT AGCAAGGAAG AAGCTGAAGA AGCTGGCGTT 14280
 GAAGTAGGCA ATATGGTTAC GCCATATAGT GAATTTGAAG TGCTTGCAAA TGATAAATAT 14340
 10 TTAAGTGCAG AICATTTGAT AATCGCTATG GCTGTGCATT AGCTATTGAG GTATTAAAC 14400
 GTTTAAAAGA TGAAAATATT GGCATTAAC TATACAGTGG TGCCACAGTG CAAGAAGAAG 14460
 TTGGTTTGCG TGGTGCAGAA GTGGCAGCGA ATACGATTAA ACCAGACTTG GCGATAgcTG 14520
 15 TcGATGTAGG TATTGCTTAT GATACCCAG GTATGTCAGG TCAAACGAGC GATAGTAAAC 14580
 TAGGCGGTGG TCCAGTTGTC ATTATGATGG ATGCTACAAG TATTGCTCAC CAAGGTTTGC 14640
 GAAAgcATaT TAAAGATGTA GCTAAGGAAC ATAACATCGA AGTACAATGG GATACGACAC 14700
 20 CAGGTGGAGG TACAGATGCG GGAAGTATTC ATGTCGCAAA TGAAGGTATT CCAACGATGA 14760
 CAATCGGTGT TACGCTGCCA TACATGCATT CTAATGTTTC AGTGCTCAAT GTAGATGATT 14820
 25 ATGAAAATTC TATCCGTCTT GTTACTGAAA TTGTCCGTTT ATTGAATGAT GAAAGTTATA 14880
 AAAATATCAT GTGGAATCA AATCCATAAA TAATAAGAA TCCTTTTAAT ATGGTAGGTT 14940
 GTTAAACAAT TGTCTAATTT TAATCTTAG TCATTAGACA GTATCCATGT TAATAGGATT 15000
 30 TTTTGT TTTT AATTTAAATG CTGAAAATCA ATTATGCCTA AATTTTGATA TTACAAGAAA 15060
 ATGATTTTTT CTTAAATGTA ATTGCACTAA AAACCAAAAA AACGGGAATA ATATACCTGA 15120
 TATATTACAT GAGGAGCGGT GCAAATGTTG TTAGAAATTA AAGATTTAGT GTATAAGCG 15180
 35 AGCGATAGAA TCATACTAGA TCATATCAGT CTAAAAGTAG ATAAAGGCGA GAGTATTGCC 15240
 ATTATAGGTC CATCAGGTAG TGGTAAAAGT ACATTTCAAA AGCAAATATG TAATTTGTTT 15300
 AGTCCAATA GTGGAGAACT TTATTTTAAA GGTAAACCCT ATAATGATTA TGACCCGGAA 15360
 40 GAATTGCGTC AACGAATCAG TTATTTGATG CAGCAAAGTG ACTTGTTTGG TGAAACGATT 15420
 GAAGATAACA TGATATTCCC ATCACTTGCA CGTAATGATA AATTTGATAG AAAACGTGCA 15480
 45 AAGCAATTAA TTAAAGATGT CGGTTTGGA CATTATCAAT TAAGTTGGA AGTGGAAAT 15540
 ATGTCGGGTG GTGAGCGGCA AAGAATTGCT ATAGCGCGCC AACTGATGTA TACACCGGAT 15600
 ATTCTTTTAT TAGATGAATC GACCAGTGCA TTAGACGTTA ATAATAAGA AAAGATAGAA 15660
 50 AATATCATTT TTAAATTAGC AGATCAAGGC GTGGCAATTA TGTGGATTAC CCACAGCGAT 15720
 GACCAAAGTA TGCACACTT TCAAAGCGT ATAACAATTG TTGATGGTCA AATTTCTAAT 15780

55

EP 0 786 519 A2

	CATTCGGATT ATCATTTCAT ATAAAGAAGG TTTACATATT ATTAAAGATT TAATTGTTGC	15900
	GACATTACGA GCAGTTGTGC AATTAATCAT TTTGGGATTI TTGCTGCATT ATATTTTAA	15960
5	AATAAACGAT AAATGGCTGC TTATTTTATG TGTATTGGTC ATTATTATTA ATGCATCATG	16020
	GAATACAATT AGTCGAGCAT CACCAGTGAT GCATCATGTG TTTTGGATAT CATTTCTAGC	16080
	TATCTTCATT GGAACGGCAT TACCGCTTGC AGGTACTATT GCGACAGGGG CCATTCAATT	16140
10	TACCGCAAAT GAAGTTATAC CTATCGGCGG CATGCTTGCA AATAATGGCT TGATTGCAAT	16200
	TAATTTAGCT TACCAGAATT TAGATCGTGC ATTCGTACAA GATGGTACTA ATATTGAATC	16260
	TAAATTATCA CTTGCAGCTA CACCTAAATT GGCTTCTAAA GGTGCAATAC GTGAAAGTAT	16320
15	TCGTTTAGCT ATAGTGCCAA CTATTGATTC GGTAAAACA TATGGGCTTG TGTGATTCC	16380
	TGGTATGATG ACAGGCTTAA TTATTGGTGG CGTACCACCT TTACAAGCGA TTAAATTTCA	16440
20	ATTGTTAGTC GTGTTTATTC ATACAACTGC GACCATTATG TCTGCTTTGA TTGCGACATA	16500
	TTTAAGCTAT GGTCAATTTT TCAATGCAAG ACATCAATTA GTAGCACGAA ATACTGATGT	16560
	TAAGAGTGAA TCATGATAGA TTTTACTGCA TCAGATTTAG GCATTAGTTT TAATTGGAAA	16620
25	TGAAGTGACG CGCACATATA GTATCGCTAT TCATTAGCGC AGCGAAAATA TTCATAAAGG	16680
	CACGCATACT TTGTAGTCAG TTATCTGTTT TGACATATAA AGCGTGCGTG CTTTTTTGGA	16740
	GTTATTGTTG AAACGAAGT AATTATACAT AATTATTAAA TGACATACTT GTGTTAATTT	16800
30	TTCAAATACT GAAAAACAAT TTCaATAATT TTCCaATTAA GCACAGAAAA TTAAAGCAAA	16860
	ATATTATATA ATAGAACGGT TATATATAaA nATTngTgCA CACATTTTTT AATAAATCGT	16920
	TATTCTAAGG GAAATGAATA TCGGAAATTT TGTGTTGAAAG GAGTTTTTAA TTGTCAATCA	16980
35	TGCGACTATT TACATTCATT TTAAGTATTT TTATCGTAGG AATGGTTGAA ATGATGGTTG	17040
	CAGGAATTAT GAACTTGATG AGTCAGGACT TACATGTATC AGAAGCTGTC GTTGGTCAAT	17100
	TAGTGACAAT GTACGCTTTA ACATTTGCGA TATGTGGACC TATTCTGGTT AAATTAACGA	17160
40	ACCGTTTTTC ATCAAGGCCT GTATTATTAT GGACATTACT TATATTTATC ATTGGTAATG	17220
	GCATTATTGC TGTAGCGCCA AATTTTTCaA TATTAGTAGT TGGTAGAATT ATCTCATCTG	17280
45	CAGCAGCAGC ACTAATTATC GTAAAAGTAT TAGCTATTAC AGCGATGTTA TCAGCACCTA	17340
	AAAATCGTGG TAAAATGATT GGAATTGTCT ATACAGGGTT TAGTGGTGCT AATGTTTTTG	17400
	GTGTACCAAT TGGAACGGTT ATCGGCGATT TAGTAGGTTG GCGCTATACA TTTCTATTCT	17460
50	TAATTATTGT GAGTATTATT GTTGGCTTCT TGATGATGAT CTATTTACCG AAGGATCAGG	17520
	AAATACAACG AGGCCCTGTG AATCATGAGA CACCATCTCA TGAAAATCAT GTTACTTCGA	17580

55

EP 0 786 519 A2

	CAAAC	TCA	GTG	AC	TT	CG	TC	TT	TAA	AT	C	ACT	TAT	TTT	AT	CT	AAT	GGT	CAT	GAT	AT	GT	17700		
	CAT	TC	GTT	TT	C	ATT	AG	CA	CT	T	CT	AG	TAA	AT	G	AA	TC	G	CT	GG	CG	TT	ATT	17760	
5	GT	GG	TAT	ATT	CT	CC	GATA	AAA	ATT	ACA	AG	T	AG	CT	T	GG	TT	AAT	GAT	TT	T	CT	ATT	17820	
	TT	AT	CG	TC	AT	GAT	TT	ACT	T	AT	GAA	TT	TAA	TCT	TAC	CT	GG	TTC	AG	G	TCT	A	TT	17880	
	GAC	TAT	TT	AT	TT	GGA	AT	AT	C	AT	GGA	G	TACT	AAT	CC	AG	CAG	TG	CAA	AG	CG	G	TG	17940	
10	TT	CA	AC	AT	GT	TGA	AG	GCG	AC	ACA	AG	CCA	AG	TA	AT	GAG	TTG	GA	AC	AT	G	TCT	AG	18000	
	CT	GG	TAT	TGG	TG	TT	G	AG	GC	ATT	ATT	G	GAG	GCT	T	GG	T	CAT	GAC	AC	AT	G	TT	18060	
15	CT	AT	C	AC	ATA	TAC	GAG	T	GCC	AT	CAT	T	GCG	C	ATT	AG	G	ATT	AAT	C	G	T	T	18120	
	AAA	TA	AT	CA	TTAT	GCT	AAA	AC	AT	TTT	TAA	AT	CAT	CATA	ATT	CT	CAT	AT	GAm	AAG	CAC	G	CCT	18180	
	GCT	AT	CAA	AT	TC	AG	G	T	G	T	G	T	G	T	G	T	G	T	G	T	G	T	G	T	18240
20	GCG	AC	G	TT	CA	TTAT	GATA	CA	TCG	G	CCA	AGG	CAT	TTT	TAC	CG	CTT	TT	AG	CAA	AAT	TA	GCTAA	18300	
	AT	CAT	TTT	GC	ATT	TG	TC	GAC	TTAAA	ATTT	AAG	GT	Ga	GCA	GT	TG	TT	GGa	AT	GAT				18355	

(2) INFORMATION FOR SEQ ID NO: 68:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 1192 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 68:

	CGCAA	AAGA	AG	TACAAAAA	AT	GTTTTT	TACAA	GAAG	G	TATTA	AAAC	ACCT	CA	ACCA	ATTATG	60
35	ACTG	CTTATA	ATCAT	AGTGA	AAACG	gTGTT	TAGTAG	TTTA	TAAT	ACAT	GG	AGGT	CATATT	120		
	TAAT	GGCGTC	AAAAT	ATGGA	ATAA	ATGATA	TAGTAG	AAAT	GAAAAA	ACAA	CATG	CGTG	TG	180		
40	GAACA	AACCG	TTTTA	AGATT	ATTAGA	ATGG	GTGC	AGACAT	AAGA	ATTAAA	TGTG	AAAATT	240			
	GTCAA	AAGA	AG	TATTAT	GATT	CCACG	TCAAA	CGTT	TGATAA	AAAACT	TAAA	AAAAT	CATCG	300		
	AATCT	CATGA	TGATA	CACAA	AGATA	GAGAGA	ATGAT	TAAATG	GCTTTA	ACAG	CAGGT	ATCGT	360			
45	TGGAT	TGCCA	AACGT	TGGTA	AATCA	ACATT	ATTTA	ATGCA	ATAACA	AAAAG	CAGGT	GCTTT	420			
	AGCAG	CGAAC	TATCC	ATT	CTAC	GATTGA	TCCTA	ATGTA	GGGAT	AGTAG	AAGT	GCCAGA	480			
	TGCTA	GATTA	CTTAA	ATTAG	AAGAA	ATGGT	TCAAC	CTAAA	AAGAC	ATTGC	CGACT	TACATT	540			
50	TGAAT	TTTACA	GATAT	CGCTG	GTATT	TGTGAA	AGGT	GCTTCA	AAGG	GAGAAG	GGTTAG	GTAA	600			
	TAAAT	TCTTA	TCACAT	ATTA	GAGA	AGTAGA	TGCG	ATTTGT	CAGGT	CGTTC	GTGC	ATTGA	660			

TAATATGGAA TTAGTACTAG CGGACTTAGA ATCTGTTGAG AAACGTTTGC CTAGAATTGA 780
 AAAATTAGCA CGTCAAAAAG ATAAGACTGC TGAAATGGAA GTACGTATTT TAACAACTAT 840
 5 TAAAGAAGCT TTAGAAAAATG GTAAACCCGC TCGTAGTATT GACTTTAATG AAGAAGATCA 900
 AAAATGGGTG AATCAAGCGC AATTACTGAC TTCTAAAAAA ATGCTTTATA TCGCTAATGT 960
 TGGTGAAGAT GAAATTGGTG ATGATGATAA TGATAAAGTA AAAGCGATTG GTGAATATGC 1020
 10 AGCGCAAGAA GACTCTGAAG TGATTGTTAT TAGTGCAAAA ATTGAAGAAG AAATTGCTAC 1080
 ATTAGATGAT GAAGATAAAG AAATGTTCTT AGAAGaTTTA GGTATCGaAG AACCAGGATT 1140
 AGATCgrTTA ATTAGGAmCA ctTATGAATT ATTAGhTTA TCCACCATAA TT 1192
 15

(2) INFORMATION FOR SEQ ID NO: 69:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 7494 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 69:

AATATAGCTG CAATAGCATC TCGTTTCATT TGTATAATCA ATTCCGGTTT AAATATCAGT 60
 GTGAACGTAA GCACGACACA GATTAAAAAT AACACTGCCG GAATGAGTCG TTTCAATCGT 120
 30 CGCTtCCAAA ACTCTAGCAA ATCGATTTT TCGTCCGAT AATACTCACT TATCAACAAA 180
 CTTGTTATTA AATAACCTGA AATAACGAAG AATGTATCTA CTCCTAAAAA GCCCCCACTT 240
 AACCATTGTG CATTCAAGTG ATAAATAATG ATTCTATAA CTGCGAATGC CCTCAATCCA 300
 35 TCTAATCCAG GTAAGTATCG CGGGGAATAC ATTTTTTCTA AACGTTTAAA GTCTTTTGTA 360
 TCCATGTTAA TAAACGCCCC ATTTATTTT CTCTATTTTG TAGTATATCA CAATATTTT 420
 GAAAATAAAA TATTGCACTG aTTTTCATTA ATTGATTTAA CCCTTAATTA AGATAGTTTT 480
 40 AAATTTTTTA TTAAGTAGAA AACAATTATT ACAGTTGATT TCATTACTGC AAACCACATA 540
 TAAATTGTG CATTTTACTA CATAACATAG ATTATCATAG ATTCTTGAAT TTTTAGCAAA 600
 ATAACGTGTA TTTTCATTAT ATTTTACAA AAAAAGGTTT GTTTTATATT TTATGCATCT 660
 45 TACTGTAACA GAATCATTAA GATATGCTAT TCGAATATAC TTTTCAAAA TTTATATAAT 720
 GAATAAATTA ACATGTATTG AAAAAAAGC GAAATGCAGC CTATCCTCTA ATGTAAACCA 780
 50 AACGATATAT CTCGTCAGAC TTTATATTTA AACGCTATGT GTCACTTTAA AAATGAATAT 840
 TACTAAGATT GTCATATCAA TTATTATTGC ATCGAATTAA TCTTTTAAAT TTCTGTAATA 900

	ACGGAAGTCA TTATTAGAAT AAAAATACTG TGCCTAATA AATTTATCAA TTGTTCTCTAA	1020
	ATAAATACCA TCGATATTTT GTTCTTTTACA TGTCATTATA ACTTTATCTA AAAGTTTTTT	1080
5	ACCTATTTTT AAATTCCTAT AACCTTTATC AACAAACATT TTTTAAAGTG CAGACATATT	1140
	ATTATCTAGT CTAATCAAAC CTATAGTACC AACAAATATT TGaTGATTGT TTATTGCAAG	1200
	CCAAAATgCC CTCCATTATT CAAATAGTTA TGTTTCGATGT TCTCCAAATC AGGTTGATCA	1260
10	TCTCTATCAA TTTTATATa AATTCATTTT TTTGAATCGA TAAAATAAAC TCGATTAGCT	1320
	CTTCCTTATA AGACCTATTA TATTCAATTa TGTTTATAGC CATTTTTATC TCCTTTTTCA	1380
15	TTTAATTTAA TTATAAAATG TGCGTTTAGT TTGTATCTAG TGTACTCAGT ACAGCCTCAA	1440
	ATGAAGTTTC ATTCCACTTG GCACTTAATA AAGACAAGTA TTTTAGCAGT AATACAATAA	1500
	AGTCCAATAA ATTTCCCTAA CTTCAATATC CACTTTTTAA AAAATGTATT TTTAATTAAT	1560
20	AAAAAACTC TCCCCAATTT CTATGGGAAG AGCTATATAT TTAATGTCTA AACATTACTT	1620
	TTATTTATTA TGAAGGAATT AGAATCCCCA AGCACCTAAA CTTGTGCTT TGTATGCTTT	1680
	AACAGCTGCG TTGATTTGTT GGTCAACAGT GTTGTGTTGA CCCCACCTG GCATAGTTTG	1740
25	GAATAAACCT GAAGCACCTG ATGGGTGTA AGCATTTACT TGACCATTG ATTACGAGC	1800
	GATGATTGCA GCCCATGTAG AAGCTGAAAC ACCAGTACGT TGAGCCATGA TTTGAGCTGC	1860
	TGATGAACCA GTAGCACCTG CAGTATTACC ATTGCTTAAT CTCACTGAAC TTGAAGTAGT	1920
30	TGAAGTGCTG TAGTTATGGT AAGTTGGAGC TGAAACAGCT TCAACGTcTG AGTTACTTGA	1980
	TTGTGCATTG TAGCTTACTG ATTGTACATT TGAACCTTGG TTGTATGAAG TAGTGTAGTC	2040
	TGCACCTGCA ACGTTTGAGA AACCAGCAGT TTGACCATTA GCTGCTTCAT AGCTCCATGA	2100
35	CCATGTAGTA CCATTTGAAG TGAAGTTATA TTGGAAACCA TCTTTTACAA AGTGGATGTC	2160
	ATATGACCA TCTTTGATTG GAGCTGCATT TAATTGATCT TGGTGATTAT GCGCTAAGTC	2220
	AACTAAGTGT GCTTGATCAA CGTTTACTTC AGCAGCGTGT GCTTGATGTC CTGTACCTGC	2280
40	TGCGTAACCT GTTACACCTA ATGCCACTGC TAATGATGAT GCCATAATTG TCTTTTTCAT	2340
	AGTAAAAAAT CCTCCAGTAA TAATTGTnAG TTIATGTTTT TAGTAATTAT AtTTTGaATT	2400
45	TGAATGTCGT AGTgCAAGTT TAAATTGTCT TTIATTTCTT TCaACGGTAC TCACTATATC	2460
	ACaAAAAACC AGCCAGTAAA TTACACTTTC TTACAAAAC ATTACAATAT CAAGTGTTAT	2520
	TTGtAATGTT GAAATATGGC TGTTTATAC TGTAATGTGA AATATGTGCC CTTTAGAATC	2580
50	CAATCAACCC TTGAAATAGT CTTTAACACA TAAGATTTTT ACTATATTTA GCTCAACTAT	2640
	TACAGCTTTC GTAATATTAC AGATTGTATT TTTGTTACAT AGCTGTAATA TATCTGACAT	2700

55

EP 0 786 519 A2

	TACACATGTA TTGATTGCTA TTATTGTTGT ATATTCAAAG TTTTAAAACA CACATCTTTT	2820
	GTGAATTGTC TTATCTTTTA TTAGCGCAAA TAAACTGCAG CTCAATTATA TTGTTCAACT	2880
5	TCATTCTCGC AATTCACAAT AACATTAAAT AATTTTGGT CTCATATTTT CAAAAACAT	2940
	ACTGTTATTA TCCCATGAAT TTA AAAATAT CATTAGTATA TAAACGAAAC ACTTTACGAT	3000
	AAATGATATC TGCAAGCCAA GCTGTTACAA ATGGTACAAC AAAGAACGCT ACTACAATTA	3060
10	GTAAGACACT CAACCAAGCA GAATCAACCT CCATAAATTT AAATGCATTA ATCGGTCCTA	3120
	CCATTCTAT AAAACCAAAT CCAGCTGACT CTTTCGTTCC ATGAATACCT ACTAATGCTG	3180
	ATACCAAACC TGATACAATG GCTGTCGTTA ATATTGGTAA CATAAGAATT GGATATTTCA	3240
15	CCATATTAGG TATCATCATT TTAACGCCTC CAAAGAAGAC GGATAACGGC ACCCCTAAAC	3300
	GATTCACTTT ACTTGTAACA ATTATCAATA CTGCTTCAGT CGCGGAGATA CCAATTGACG	3360
20	CTGATCCAGC TGCTAAACCT GTAATACCTA TCGCAAAGGC AATGGCCACA GTTGATAGTG	3420
	GCGAAATAAT AATAAGACTA AATACCATTG AAATCAAAT ACTCATGACA ATCGGTTGTA	3480
	ATTCTGTAAA ACCATTAACC ATATTACCGA TGGTGTGTTG AATCATTTTC GTATACGGCA	3540
25	ATATTAAAC ACCAATTGCA CCTGAAATAC CGCCAACAAC TGTTGGGAAT ACAATCAATG	3600
	CCATACTACC TACGCGATGT TGAATAAGTA AAATGAATAA CACTGCAATC GCTGCTGTAA	3660
	TCATTGTATT AATTAAATCA CCAATACCCG TAATCATCCA AGCACCATT TTA AACTGCG	3720
30	CTGCACCGCT TCCTACATAT GCTGCACTTG CCACAACAGC AATTGCTAAT GGCGATAGGT	3780
	CAAATTCAT GGCAACCAAT GCACCAATCA AAGCAGGTAC TGTA AATTGA ATTGCAACGA	3840
	CAACGCCTAA TAACGTTTTA AAAATCGGAT GATAATCCAT AAAGTATTTA AAAATTTCTC	3900
35	CAAGTATCGC ATTAGGAAC TAAACCCGCA CAATACCTAT GGCGACACCT GATAAAACTC	3960
	TAAATATAAA ATCTTTGGGT GTAATTGTTT TAATTGATGT CATAATATCA TCCTTCCATT	4020
40	TATGTATATA CATCTGTATG CAAATAATAA AGAGCCTTAA GTTATAAGCT GCCACTAGCT	4080
	TAAATCTAA GATGTGCATG CCGATGTTGT TATATTTAGG CTAGCAGTAT CATCTATAAC	4140
	TCAAGACTAT GAAAAATAGT ATATCACAAA ATTCTGAATT TTTAGATAAA TAAATTGGCA	4200
45	ATTTTCAAA CATATTGTTA CAATACACTT TTATTTTATC TTCATTTTTA AAATCCATTA	4260
	ATACAATAGA AGAAAGACAT TCAAATGCTT ACCAAAAAGG TACATTATTT GTTAGGAGCG	4320
	TATCAGCACT TACATATCAT CAACACAATT GACAATATAA TAGAAGATAC TGATAATAAG	4380
50	TGTTAAAACA ACAGATGTTA GGTAGTGAAC AAATGATGGA AAGTAAATCC ATAGATCCAA	4440
	GAATCGTTAG AACCAACAA TTGCTGTGCG ATGCTTTTCT TAA AATTCT AGAGAAAAGA	4500

55

EP 0 786 519 A2

	TTTACGCTCA TTTCGCTGAT AAAGAAGACC TCCTAGACTA CACATTATCT GTAACCATTT	4620
	TAAAAGACTT GAATGATAAT TTGAGCATTT CTAATGTCTAT TAATGAAAAG GTTCTGCGTA	4680
5	ATATTTTCAT TTCAATTGCG AGTTATATCA AAGATGCTGC AAAGTCTTGC GAATTAAATA	4740
	GTGAAGCATT TTGCAACAAA GCACATCAAC GTATTAATAA TGAATTAGAA GATATTTTTG	4800
10	CGATTATGTT AGAAAACAGC TATCCGGAGC ATCAACGAGA TATCATGTGA AATAGTGCGA	4860
	GTTTTTTAGC AGCTGGTATC TCAGGCTTAG CATTACATTG GTTTAACACG AGTCAAGAGA	4920
	CAGCCGATGT GTTTATCGAT CGCAACCTTC CATTTTTAAT TCATCATATA GCACATTTTT	4980
15	AATAAACTT GGTATTTAGT CATGCATCTT GAAATCACTA TGTGACTTAG GTTCATACTT	5040
	GTACACACAA TAAATTTAA CGTATTACGA TTGATTAGCC GTGTCTAGGA CATAAATCAA	5100
	CGTCTATAC TCTACAATGT CATATTAGCA GTCGTTAAC TGAATGAAAAT AAGCTTGTCA	5160
20	TTAAAACATA TAGATTTTAG TGACAAGCAT TTTTGTTTT GCGTACTTAA ACAACACTTC	5220
	AGGCAATATG TTGTTTAGGC AACAAATGAT ATGTGCGTGT TTATTGGCAA ACGTACGACA	5280
	TAGTAGTATA GTATGTCTAA ACAACATATG TTGCATAGTT GATATGCGTT GTTTAAATAC	5340
25	TAAGATAGGA GGGATTGACG TGAGCGAGAC AGATGAACCT CAGGGGTTTG AACGCACGCA	5400
	TAATATATTA AATATTAATC AGAGTAGTCT GGGTGTAGTG ACATACATTA CAAATAAATT	5460
	AAAGTCGACG TTGAAGCAAC ACATAATAAT TGCTCGTGGT AAAAAGCGAA TCGACTATCG	5520
30	ACTGTCGTAT AACTTTTACA TACGTATTAT GATAATGTAG AAATCAAGAA AATCGACTGT	5580
	GAATATACCT ATGCTATGCC CATTGCAATT TTAATAAGAC ACACGATGTC ATTGACAAAT	5640
35	GCTCATTTCT TTGCTCAGTT ACGTCATCCT GTCTTATAAA ACAACATTGC AGACATGTAT	5700
	ATCAAACGAC ACTTCAATAA CATCACTTTG CCCATCGTAC TACTAGTAAA ATCGTGTCTC	5760
	AAATCCCTTA TTTTAATTCC AAAAACTGCTG TGGTCAAAAG ACCGAGAAAC TAAAAACATT	5820
40	ACTTAATGTG TTGATAAATT ACCATATAAA AATAATCTCA AAATATATCA ACACTTGATT	5880
	CTAAGGAGGA TATGACAATA TGAAAATTTT AGATAGAATT AATGAACTTG CAAATAAAGA	5940
	AAAAGTACAA CCACTTACTG TAGCTGAAAA ACAAGAACAA CATGCATTGC GTCAAGACTA	6000
45	CTTAAGCATG ATCCGAGGAC AAGTATTAAC AACATTTTCC ACAATAAAAG TGGTTGATCC	6060
	AATCGGTcAG GATGTCACAC CAGATAAAGT TTATGATCTT CGCCAACAAT ACGGTTATAT	6120
	TCaAAATTAA tATTTGCTCA CGAGGTATTG CACTTAAGGT GCCAACTGAC CTCATAAACA	6180
50	AAGCCCATAC TGATTGAAGA CACTAATGTG tCsacCATGG TGCACATTAC GCTTCATCTC	6240
	TGTATGGGCT TTTTATTTAT TCTTTTGAGA ATTTCATTTT AGCAGACCAA AAAATTAAAA	6300
55		

EP 0 786 519 A2

5
10
15
20
25
30
35

TGAACGACTG	TGCCACCCGC	TTCTTTCAC	TTATTCACCA	ACTGGTCAAC	TTCTTCATTT	6420
GTGTTACAC	CTAGAGAAAT	CATCACTTCA	TTTGGTTCAG	TATTAAGGCT	TTGCTGACTT	6480
ACATTTTGAA	AATGCTTGTh	TTCTATTAAA	ATTACGGkTG	tTTGACCTAT	tTGAATGCCG	6540
ACCATTTTAT	CTAACATTTG	TGGGTTTCTA	TTTATTTTAA	ATCCTAACGC	TTTATAAAAC	6600
TGTGCGCTCT	TTTCTAAATC	TTGCACATGC	AAATTAAACC	ACATTGATTG	AATCATGATT	6660
GCACCCCAT	CATTACTTAT	TATAGTTTGT	GACTTTAAGC	CAATCACTTA	ATGATAATCT	6720
TGTTGGATTT	ATTTCAGCCA	TTAATTCAAA	GTCTACTTCA	TAACCTTTTT	CTTCCAACCA	6780
TTGCTTTTCT	GCAACACCAC	TAACAAATTC	TCCTTCTATA	ACAGTAGATT	TACCTGTCAC	6840
TTCACTAAAA	ATTGTTGCTG	CTTCACTTAA	TGTAACCTCA	TCGGAACCAA	TCTCTATTGA	6900
TTGATGCGTA	AAGCTTTGTG	GATGTGCAAA	AATATACGAT	GCAATTTTAG	CTATATCAAT	6960
AGAAGAAATC	ATTGTGAATT	TTATATTCGG	ATTAATAAAT	TCTGGTAATG	TAATACGTTT	7020
ATCTTCGACT	TTAGCAATGC	GTAAAAAATT	ATCCATAAAG	AATGATGGTT	TGATAACTGT	7080
TGCATTTATA	TTAGATTCCA	TTAATCTATT	TTCTATTTTT	GCTAGTACTT	CAAAGTGTGG	7140
GCCAGTTCGA	TTTCGATTAA	CCCCTCCCGC	AGTACTATAC	ACAATATGTT	GAATATTTTC	7200
TTGCTCAGCT	ATTTCAATTA	TCTTCATACC	TTGTCTTAAT	TCTTCGCTAA	CATCATCTTT	7260
AACGATTGGC	TGAATACTGT	ATAAGCCATA	CTTACCTTTC	ATCGCTGATT	GCAAACCTAAC	7320
ATTATCACTC	AGATCACCTT	CArCGATTGA	TAAATGCGGA	TGTCCTATGT	CTGAAAGTTT	7380
ACGATTATnC	TTATTTCTAG	TTAATGCACT	TACATACCAT	CCATCCTCTA	ACAACTGTTT	7440
TACAACTGCA	TTACCTTGCT	TCCCTGTTGC	GCCTATTACn	AAAATATCTT	TCAT	7494

(2) INFORMATION FOR SEQ ID NO: 70:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 11802 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 70:

45
50
55

AATTTATTTT	GCCGTCCAC	CCCAACTTGC	ATTGTCTGTA	GAAATTGGGA	ATCCAATTTT	60
TCTTTGTTGG	GGCCCCGCCC	CAACTCGCAT	TGCCTGTAGA	ATTTCTTTTC	GAAATTCTCT	120
GTGTTGGGGC	CCCTGACTAG	AATTGAAAAA	AGCTTATTAC	AAGCGCATTT	TCGTTCAATC	180
AATTACTGCC	AATATAACTT	CGTAGATCAT	AGAACATTGA	TTTATTTCCC	AGCCTATTCT	240

	AGCAAAGGTA ATAATGATAT TAATAATGTA CAAAAAATAT AAATCAAATC GACATCCTTA	360
	TAAAACATCA GAACCACTAA AAACAAAAAA GCACAAAATA AAATTAAATT TAAAAATAAC	420
5	GACCACTTTT CAAAAAATC TCtTTTCaTa TTTCCACCCC TAATTTTAAT AAGCATTATT	480
	TTATATTCTC TTTTAAGTTT ATTATTCAAA AGGAAAACAG AAATATCTTT CaATATTATT	540
10	ATAAACATTT CAACTACTTT TAAAAACCA CAAAAAATA CTTATTTTAA GTAGATGAGC	600
	ATAAGTGAAC ATAGTTCTTT AGTTATAATA ATTAATTCAA CCAAAAGTCG ATTTGTTTTT	660
	GCAATTGGTT TTCATTTCTT CTTAAAGATA TTTTCATTAA ATCTGTCAAA TCAATAGACG	720
15	CTATATTTTT CAACTTATCT CTATATTTAT TTTTAGTACG TCTTTCTAAA TTTCCCCATT	780
	CCTCTTCTTC GTGAGTTAAT AAATGAAGCA TTGCTCGTTC TTGTATATTT TCAATCATT	840
	TTAAATTCGG TTTTAAAATA TGCAAATCAT CAAAACAATC TTCCAACAA TCAACCATAT	900
20	CTCGTTTTAA TTCAATTTCC ACACGCCATA GAAATGTTGA ATCAATTTCA ACATCTGCAT	960
	TATCTTTACG TTCTTGTTTT TATTATAAAT CCGAATAAAC CTATCACTAT TACGCACACC	1020
25	AAAATATTTT GTTCTGGTT TTACATTACG TCCATAAAAT ATAGTTTTCT TTACCGACTT	1080
	ATCTGACAAT GCATAATAGT CATTAAATC AAATTCAAAA TCAAAAGCCA AATCTAATCT	1140
	CGTAAACTA ACATCGTCCA AATAACTGAT GATATTTTGT TTTAACCAA GCACTTCATC	1200
30	ATGCGAAAGC TTATTAGGAT TAAATTCAAC GCGCATATAC GTCTATTCCA AAGAGTTGCT	1260
	TTTATTTTGT CATATTCAAT ATAAACTTTT TCTTTAAGAG CTTTAGCTTT AAAGTTTGTT	1320
	TGTAAATAT CCCAAAGCCG AATTTACAGG TTAGTACTCA TAAATGTGA AAGTCTCTCT	1380
35	GCGTTAGACA TGCTAAGATT CCCAACAATC GTTATAGCGT CAAAAGACAA TTTTGGAATA	1440
	GCTAGTGACA TCCTATGTCT ATTTAACCGG CTATTACCGG ATATTAGAGT ATCCAGTTTT	1500
	ACAAATGGAT GAAACGAAAT TCAAAACACT AAAAAATATG TTCCACTAAC AGCAAAAAAA	1560
40	TACCATTATG TTCTACTAA AAAACyAAAA ATACTGGAGA ACAAATGTCA GGATATAACT	1620
	TAGGATACTA TGTAATAAAA ATTTACAATA AAAAAACAGG AAAACAAATT TCAAGTAAAA	1680
45	GmATACCCAT ACAAAGAGGA TAAATAAAA AACCTCGAAC TGaAATGATG ATCTTTTCAG	1740
	CTCGAGGTTT AAATATTGGT GCCTTATTTA TATAGATTCT TTATATTATA TTCTCTATTT	1800
	TCATTAACmT AATCCTTAAA GAGTTTTAAA TTAATACCTG CTAGATGATT CAAAAATGTT	1860
50	TCATCAACTT TTAAATAATT CAATAATTTT TGTGGTGTCA GTAAATnTCT ATCAAAATAC	1920
	AACTTTAATA AACTATTCTT TTTGACAGGA CGTGACATTT CAATCACGTC GTCTAAAGAT	1980
55	AATACTTTCT CGCTTTAnAC AAAnACAAAA ACTTACCCGA TTAAATCAA GTAAGTTTTA	2040

EP 0 786 519 A2

	TATTTGATAA AAAATCAATA AGTAATTGTG CGCCTTCAAC TTGAATATCT TTTACAACCTG	2160
	GCGCGTCGAT ATACATATCA TACTGACCAC CGCCTACTGC ACGATAATTA TTTACACAAA	2220
5	TTGTATATGT CTGCTTTAAA TCAACTGCGT GACCTTGAAT CATCATATTG CTCACACGTT	2280
	GTCCCTTTGG TCTTCCAACA TGAATGGTAT AACTTACGCC ACCATATATA TCATAATTAA	2340
10	AGTGTGTGG TTTGGGTTCA AGGAAGTCTG CGCTCACACT AACTTCATCA TTTTTCACGT	2400
	CAAAATATTC TGCTGATCGT TCAATGGCTT CTTTAAGTTT GGCACCACTT ACAGCTAAAA	2460
	CTTTAAATGT ATTTGGAAAT GGGTAATTGT TAATAACATC TCGCATCGTC ACGACTTGCT	2520
15	TGAAACCACT AGCAGAATCA AACAAAGCTG TACAGGCAAC ATCTGCGTCA CTTTTTTCTA	2580
	ATAAAGCGTA ATTCATAAAA TTTGTAAAAG GATGCGGTGC CACACGTGCC TCAAATGCAT	2640
	GATTAATCGT CATATCATAT GGCAATGTAG TAATTTCTGA ATCTAACCAG TCCTCTAACT	2700
20	GCTTTCGTAA ATGTTGGTCA TCTTCATCAA TAGTAAATGT GGAATCATCT ATAACAGGAA	2760
	GTAATTCACA TGATTCAACG GATAGATTTT CATATTCATC AGTACTCAAG ACTACTCTGC	2820
25	CTACAGTTGT ACCTCTCGTA CCAGGTTGAA TCACAGCCGT TTGCTTAAAC CTTTCAGCAA	2880
	TTTGTCCGATG TTGGTGACCC GTAATAAAGA TATCTATATC TTTAGAAAAC GCTTCTAACA	2940
	TGGCATATCC TTCATTTTCA CCCGTTAATA CTTCGGTCGG CGTACCACTT TCTAAATCCT	3000
30	TTTCAAATCC ACCATGGTAA CAAACCACAA TGATATCTGC ATGTCGCTTC ATTTCAGGTA	3060
	AGTATTGTTG AAGTATTTCA AAAGCACTAT GAAACGTAT GnCnTGAATA TGCTCTGGTT	3120
	GTTCCCAATG GGGAAATAAT TGTGTCGTTA AACCTATCAC ACCAACAGTT TGATCTCCAA	3180
35	CCTGAAAATA CTTACACCCG TTATCAGTCA ATGTACTATC ATTTTCATAT ATATTAGCGC	3240
	ACAAAACCTGG ATAATTGAGT CTGCGTAAAG TGTCTTTTAA GTATGGTAAT CCATAATTAA	3300
	ATTCTATGATT ACCAAGCGTA CCAAAGTCGA ATGCCATTCT ATTATAAAAA TCAACTAAAG	3360
40	GCTGGCTACT GCCGCTATGC GCGATTAAAG AATTACAAAA TGGTGACCCT TGCAAAAAAT	3420
	CACCATATC TATTTTAAAA CTTTGGTCAT ACTGCCTTCT GTsTTGTTCT ATAACATGAT	3480
45	TCGCTAGTAA CAATCCCATA GGTGATATT GATTTCTACT CGTAAAACTT GTTGGGAAAA	3540
	TATAACCATG TACGTCACTC ACGACATAAA ATGCTATGTT TGACATCCTC ACTCACTCCT	3600
	TCAATCACAA ACATCTTTCT TATTTCTATT ATATATTTAT TTGAAGTCTG TTGTAATCAA	3660
50	GGTTTGTCA CCGAGTTTAA AACGAATCTT TGAACCTTCC ATACTTTCAA GTACTTTAGC	3720
	ATTGACCTTA ATTGTGACAT TTCCGTTTTT ATCTGCTTTA ACTGTTGGCA AAGTACTGTA	3780
55	ACCTGGTGGG TTATAATCGT TATCTTTACT TGAAAATTGT CCGATTTGAC GTCCGCCTTC	3840

	TATTGTCATT TCAAATGGCT CATTTACAGA AACATTTTGC GGGATATCAA ATGTTACTTT	3960
	TTCGTTCTGA TTTGGTGGTG TATGATCATC TGGTGTGTTT GGCTGAGGAT CTGCGCCTTT	4020
5	TTCGCTGCCA TAACTACCTG CTTTAAATGT TGTGGATCA TACCATTAT AACCCTCGG	4080
	CGGTTGTGAC CATGGCTCTT TTTCAGGCTC AGTTGAACGC TCTGGTCGTT CAAAATCAAG	4140
10	CAACTTAGTC TTTGTATCTA ATGTTAGGCT ACTCGCCTTA AGTGATTTC CATCATTATC	4200
	TTTAGACATC CAAGCCGTTA TATTATTTAA TAGCTTACCG TTGTCTTGTT CTTTAAACC	4260
	ATCATATGTT TTCTTCTTT CTCCATTATC TTCTCTTACA TATTTGGGCG AACTATCTTC	4320
15	CACAAGTGAT GAATCACCGA TAAATGCTGC TTTACCTTTT CCAACTTAG AAATTGCTAC	4380
	ATAGGGGCCT TCTGCTTTAC CGCCCCATT ATAAATACCT TGATCTACAG CATGTGACCA	4440
	TTTACTTTTC GCTGGCAATT GTTCTGGTGT ATACACAATA CCTTTTGCTT TCTCTGGATT	4500
20	AGTAATGCT AATGTCGATC CGGCATGCAT AGAGACAGAT TTCACACCTT CAGTAATACC	4560
	GAACTTTCT TTTGAAGAAA CAATATTGCT CGTATTTAAA TCACCTAGTG CATTATATCG	4620
25	AAAACGTACG CCAAAGTTG TAGATAACCA ATCTGAACTT TTCACACCTT GCATTGCAGT	4680
	AGAACTTTTT TCTTCTGCAT TCATACCTT CGACATATCT TCATATGCTC CACGTCGATA	4740
	ACCATTCAAT GCCTCCGATG AATCAATACG ATTTAAATTT CGGTCAGCAT TGTAAATGATC	4800
30	TGAAATAAAG ACAACATTGC CACCTTGTT CACATATTTA ACAATTGCTG CCTGTTCTGA	4860
	TTCTTTGAAA GGAATGTTAG CCTCAGGAAT TACAAATATT TTGGAACTTT TCAAACCTGC	4920
	TTCTGTTATG TTCGAATGAC CATCAATAGC TTTAACGTCA TAACCTTGTT TTTGTATTGA	4980
35	ATCCGCATAA TCTGAAAATG CACCATCACT AACCCAATCT GCAGCACCAG CTGTTTGACC	5040
	ATGAGAACGA TCGAATAATA CCGTCGCTG TTGCTTTGTA GGTGCGATT CATGCGTTAT	5100
40	AGCTAAAGAT TCGGTAAAG CACTTAATGA TACCGTTGCA ACAATTGCAG AGACAGTTAA	5160
	TGACTTATAT ATTTTTTTCA TTTGTGAGG CTCCTTTTAA AATAAATTTG TTCTTGAATT	5220
	ATAGGATAAA AATTCGTTGC ATATGAGCAA TTTAACGAAA AATTTACAAA ATCTTATCAA	5280
45	ACTCTTAAAG AAAGTTATTA AAATTCATTT TTATAAATA CTTTTTAACA TTTAAATGTG	5340
	GTACGCTATA AGTGTAATTT CATTGCATAC ATATTACAG ATTAAGAATG TGAAGGGGAC	5400
	AGTTATCAAA TGAAAAATTT TAAGTGTTTA TTTGTATTAA TGTTAGCAGT CATTGTTTTT	5460
50	GCAGCAGCAT GTGGAACTC AAGTTCTTTA GATAATCAAA AGAACGCTAG TAATGATTCTG	5520
	GATTCTAAAT CAGGAGGATA CAAACCTAAA GAATTAACCG TTCAATTTGT ACCTTCGCAA	5580
55	AATGCTGGAA CATTAGAAGC TAAAGCAAAA CCATTAGAAA AATTACTATC TAAAGAATTA	5640

	TCTAAAAAAG TTGATGTTGG TTTCTTACCA CCAACGGCAT ACACATTAGC ACATGATCAA	5760
	AAAGCAGCTG ATTTATTATT ACAAGCACAA CGTTTCGGTG TAAAAGAAGA TGGTTCAGCA	5820
5	AGTAAAGAAC TTGTAGATAG TTATAAATCA GAAATTCTTG TAAAAAAGA CTCAAAAATT	5880
	AAAAGCTTGA AAGATTTAAA AGGTAAGAAA ATTGCCTTAC AAGATGTAAC ATCAACTGCT	5940
10	GGATATACAT TCCCACCTTG C GATGTTAAAA AACGAAGCAG GTATTAATGC AACTAAAGAT	6000
	ATGAAAATTG TGAATGTAA AGGTCATGAC CAAGCAGTTA TCTCATTATT AAATGGAGAT	6060
	GTAGATGCTG CGGCTGTATT TAACGATGCA CGTAATACTG TGAAAAAAGA CCAACCAAAT	6120
15	GTATTTAAAG ACACACGAAT TTTAAATTA ACACAAGCTA TTCCGAATGA CACAATTTCT	6180
	GTAAGACCAG ATATGGATAA AGATTTTCAA GAAAAATTGA AAAAAGCTTT TATAGACATT	6240
	GCTAAATCAA AAGAAGGTCA CAAAATTATT AGCGAAGTTT ATTCACATGA AGGATACACA	6300
20	GAAACGAAAG ATTCAAATTT CGACATTGTA AGAGAGTACG AAAAATTAGT TAAAGATATG	6360
	AAATAATCAT TATTTAACA ATGAATCATT AGCGAATTTG GTATTAAGAG CTTTCGTTCA	6420
25	ATAGATATAT TCTAGATTAA TATTGAAAAG CTAGGCGCTA AACTGAAACA GATATAGAAA	6480
	GGTGTGCTG TACATTTGAA ACCATTTGTA CACAGAAACC CAATGTCTAT GATATTTGAG	6540
	TTTACCTTGG CTTTTCTTTA TTAAAGAAAG GTGTCAAACA TGAGTCAAAT CGAATTTAAA	6600
30	AACGTCAGTA AAGTCTATCC TAACGGTCAT GTAGGCTTGA AAAATATTAA CTTAAATATT	6660
	GAAAAAGGTG AATTGTCAGT TATTGTGCGA CTATCTGGTG CTGGGAAATC CACGTTATTA	6720
	AGATCTGTAA ATCGTTTGCA TGATATCACG TCAGGTGAAA TTTTCATCCA AGGTAAATCA	6780
35	ATCACTAAAG CCCATGGTAA AGCATTATTA GAAATGCGCC GAAATATAGG TATGATTTTC	6840
	CAACATTTTA ATTTAGTTAA ACGGTCAAGT GTATTACGAA ATGTACTAAG TGGACGTGTA	6900
	GGTTATCACC CTACTTGGA AATGGTATTA GGTTTATTCC CAAAAGAAGA CAAAATTAAG	6960
40	GCAATGGATG CACTAGAACG CGTCAATATC TTAGATAAAT ATAATCAACG CTCTGATGAA	7020
	TTATCAGGTG GCCAACAACA ACGTATATCT ATTGCACGTG CGCTATGCCA AGAATCTGAA	7080
45	ATTATTCTTG CAGATGAACC AGTTGCTTCA TTAGACCCAT TAACTACGAA ACAGGTTATG	7140
	GATGATTTAA GAAAAATCAA CCAAGAATTA GGCATCACAA TTTTAATTAA TTTACATTTT	7200
	GTTGACTTGG CAAAAGAATA TGGCACACGC ATCATTGGTT TACGTGATGG TGAAGTTGTC	7260
50	TATGATGGTC CTGCATCTGA AGCAACAGAT GACGTATTTA GTGAAATATA TGGACGTACA	7320
	ATTAAAGAAG ATGAAAAGCT AGGAGTGAAC TAACATGCCT TTAGAAATAC CTACAAAGTA	7380
55	TGACTCCCTT TTAAAGAAAA AGGTTTCTTT AAAAACGAGT TTTACCTTCA TGTTAATCAT	7440

EP 0 786 519 A2

AATACCTCAA ATAGGTGATC TATTCAAACA AATGATTCCA CCTGATTTCG AGTATTTACA 7560
 ACAAATTACA ACGCCAATGT TAGATACCAT TCGAATGGCT ATCGTAAGTA CAGTATTAGG 7620
 5 TAGCATCGTT TCAATACCAA TTGCGTTATT ATGTGCTAGC AATATCGTTC ATCAAAAGTG 7680
 GATTTCAATA CCCTCGCGCT TTATTTTAAA TATAGTTCGT ACTATTCCAG ATTTGTTATT 7740
 AGCAGCAATC TTTGTGGCTG TATTTGGAAT CCGTCAAATT CCAGGGATAT TAGCACTGTT 7800
 10 TATTTTAACT ATCTGTATTA TTGGAATAATT ATTATATGAA TCATTGGAAA CGATAGATCC 7860
 AGGTCCAATG GAAGCAATGA CGGCTGTTGG CGCTAATAAA ATAAAATGGA TTGTTTTCGG 7920
 TGTGTACCA CAAGCCATAT CGTCATTTAT GTCATACGTA TTATATGCAT TTGAAGTAAA 7980
 15 TATACGTGCT TCAGCTGTGC TTGGATTAGT CGGCGCTGGC GGTATTGGAT TGTTTTATGA 8040
 TCAAACACTT GGTTTATTTC AATATCCAAA AACAGCAACG ATTATTTTAT TTACTTTAGT 8100
 TATCGTCGTC GTCATTGATT ACATCAGTAC GAAAGTGAGG GCACATCTCG CATGACACAG 8160
 20 GAAATAGCAA AATATAATGT TCACACAAAA GCACACAAAC GAAAATTGAT TAAAAGATGG 8220
 CTTATTGCAA TTGTCGTCTT AGCTATTATC ATCTGGGCAT TTGCAGGTGT ACCAAGTTTA 8280
 25 GAACTTAAAA GTAAATCATT AGAAATCTTA AAATCCATAT TCAGCGGATT ATTCCATCCT 8340
 GATATCAGCT ATATCTATAT ACCAGATGGC GAAGACTTAT TACGTGGTTT ACTTGAAACC 8400
 TTTGCGATAG CCGTTGTAGG TACTTTCATC GCCGCAATTA TCTGTATTCC ATTAGCATTT 8460
 30 CTAGGTGCAA ATAATATGGT AAAGCTACGC CCAGTTTCAG GTGTTAGCAA ATTTATTTTA 8520
 AGTGTATAC GTGCTTCCC AGAAATTGTA ATGGCACTTA TATTTATCAA AGCTGTTGGC 8580
 35 CCAGGTTTAT TTTAGGTTG ATTAGCTTTA GGTATCCATT CCGTAGTATG CTTGGGAAAC 8640
 TTTTAGCTGA AGATATTGAA GGTCTAGATT TCAGTGCTGT AGAATCATT AAGGCCAGTG 8700
 GTGCGAATAA GATTAAAACA CTCGTATTTG CAGTCATACC ACAAATTATG CCTGCCTTTC 8760
 40 TATCACTCAT ACTTTATCGC TTTGAACTAA ACTTACGTTT AGCTTCTATA CTGGGGCTAA 8820
 TTGGGGCTGG TGGTATCGGG ACACCACTCA TATTTGCCAT TCAAACACGT TCTTGGGACC 8880
 GTGTAGGTAT TATATTAATC GGTTTAGTAC TAATGGTCGC AATTGTGCAT TTAATTTCCG 8940
 45 GTTCAATCCG AAAACGTATT GTTTAACATT AAATCAGGAT ACTCCTAAAT AAGAAGTCCT 9000
 ACCGTCTTAC GTTTCTCTAT TATAATAAAA ACAGCAGTGA AGAAACTAT TGTTATAGTT 9060
 AACTTCACTG CTGTTTTTAT AATATCTAAA TTTATTCTAT TTCAATTCCT TTAAATAACT 9120
 50 TTTACCGAAC TCTGGTAATG TTACGTTGAA ATTATCTGCT ATAGTTGCAC CGATAGAACT 9180
 GAATGTAGTA TCACTTTCTA GTGCATGACC ACCTTTAAAT TTCGGACTGT ACATAATTAC 9240

55

EP 0 786 519 A2

TGTAATAATT ACTAAATCGT CTTCTTTTAA GTTGCTAAAC AGTTCCTGGCA AGCGATCATC 9360
 GAAATCTTTA ATTGCTTGTG CATAACCTGG TTTATCACGA CGATGACCGT ATAATGCATC 9420
 5 AAAGTCTACT AAGTTTAAGA AGCTAATACC TGTGaaATCT TTCTTAACAA TTTTCATCAA 9480
 TTGATCCATA CCGTCCATGT TACTCTTCGT ACGAACCGCT TCTGTTACAC CTTCAACCATC 9540
 10 ATAAATGTCA TTAATTTTAC CGATGGCAAT AACATCATAA CCACCGTCTT TCAAATGATC 9600
 TAAGACAGTT TTACCAAAAG GTTTTAACGC ATAGTCATGT CGATTAGATG TACGTGTAAA 9660
 GTTTCCTGGT TCACCAACAT ATGGACGTGC GATAATACGA CCAATTAAAT ATTTAGGGTC 9720
 15 TTTTGTCAAC TCACGAACCT TTTACAAAT ATCATATAAC TCTTCTAATG GGATAATGTC 9780
 TTCATGTGCA GCAATTTGCA ATACTGGGTC TGCACTTGTA TAAACAATTA AGTCACCAGT 9840
 TTTCAITGG TGCTCGCCCC ACTCATCGAT AATTGCGTA CCCGATGCCG GTTTGTTAGC 9900
 20 AACAACTTTA CGACCTGTCA TTTCTTCAAT TTGTTGAATT AACTCTTCAG GGAATCCATT 9960
 AGGGTATACT TTAAAAGGTT GCATAATATT TAATCCCAT AATTCCCAGT GACCAGTCAT 10020
 TGTATCTTTA CCAACTGAAG CTTCACTCAA TTTAGTATAG TATGCTTCTG GTTGTTCAAC 10080
 25 TGCATTTACT ACTGGTAATT TATCGATGTT CCCTAGACCT AACTTTTCAA GGTTTGGTAA 10140
 AGTTTGATCG AAACCTTCTA AGGTATGTCT TAAAGTATGT GAACCTTCAT CTTTAAAATC 10200
 AGCTGCGTCT GCGCTTCAC CAATACCTAC TGAATCCATT ACGATTAAAT GTACACGATT 10260
 30 AAATGGTCTT GTCATAGCTA TCACTCCCAA AATTTATATA TATTAGTAAT CTGAATCTGC 10320
 TTCTAAACCT TGCATAATTT GAACACCTGC GCTCGACCA ATACGTGTGC CACCTGCTTC 10380
 35 AACCATTTTA TTGAAATCTT CTAAATTACG TACGCCACCT GATGCTTTTA CTTCTACATC 10440
 AGCACCTACT GTATCTTTCA TTAATTTAAC GTCCTTCTGCA GTCGCACCGC CACCTGCAAA 10500
 ACCTGTGAA GTTTTAACGA AGTCCGCACC AGCCGCTTTT GTTAATTCAC TCGCTTTTAC 10560
 40 AATTTGTC A TGGTCCAACA ATACCGTCTC AATAATCACT TTTACTGTGT GACCTTTCGC 10620
 AGCTTTAACC ACTGCTTCAA TGTCTTGTTG TACATCATCA AAACGTCCAT CTTTTAATGC 10680
 GCCGATGTTG ATGACCATGT CAATTTCATC TGCACCATT TGAATTGCAT CTTCTGTTTC 10740
 45 AAATGCTTTC GTTGCAAGTTG TCGACGCACC TAATGGGAAT CCTATTACCG TACAAACGAG 10800
 CACCTCTGAA TCAGCTAGTC GCTCTGCTGC ATATTTAACA TGTGTTGGAT TCACACATAC 10860
 50 AGATTTAAAA TTGTATGCTT TCGCTTCATC GATGATTGTA TCGATTGCG TACGTGTTGA 10920
 CTCAGGCTTC AATAAAGTGT GATCTATATA TTTCTCAAAT TTCATACTTA CTACTCCTCG 10980
 TGTATATAA TCTCTTTATT TAATTTTACT ATAAATACGA ATATATCTCG CGAATTTATA 11040

55

5 ATACTCATTAA AACCTAAAAT AATTAAAATA ATACCGAAAT GTGAACTTAA TGCATCATTG 11160
 CCTGGGAAAT TTAATGCTTT AAAATCGATT AGAGCCGCAG CAATCGCAAT ACCTACAGAT 11220
 ACCGCCACAT TAATAATTAA ATTATAAAAA CCAATAGCCA CACCTGTCAT ATTAAGATCT 11280
 ATTGTTTTAA TGGCTTCGTT AAGTAAAGGT GCATACATTA AAGCAAAGCT ACCTGCAAAG 11340
 10 AATATCATAG AAATGACGAA GATTGAAATG TGATTACCTA CTGCAAATGC AGGTAAAATC 11400
 AAGCTCAGTG CTATTAAAAT AATTGCTGTG ATAATCGCTT GTTTTGAATT CAGATATTCTG 11460
 CCGATTTTAC CACTTAGTGC ACCAACAATG ACTGCTACTA TATAACCCGG TACTAATAAC 11520
 15 AGTGATGTTG TGTCTAGTTG CAGATGATAA ATTTGCTCCA TTATGAATGG GAACGTAAAA 11580
 ATATAACCCA ATTGGATAGC ATACATTACA AATACTATAA ATAAAAATGA AGCATAACGT 11640
 TTATTTTGA AAAATGATTT ATTTACTAAT GGACGTTGCG CATTTTAAAT ATATAGCGCA 11700
 20 AAAACGATAA TCGCAATTAA GGCACCAATC ATATATAACC AATTAAAGTT CGTAATAAAC 11760
 AGCATGACTG TTGTAGCAGG GGATCCTCTA GAGTCGAnCC TG 11802

(2) INFORMATION FOR SEQ ID NO: 71:

- 25 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 1196 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 30 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 71:

35 CTAAAGAAGA TCGAAACAA GATGTTGATA AACAGTCA AGCTTTAATT GACGAAATCG 60
 ATCAAAATCC AAATCTAACA GATAAGGAAA AACAGCACT TAAAGATCGT ATTAATCAAA 120
 TACTTCAACA AGGTCATAAC GACATTAACA ATGCGATGAC AAAAGAAGCA ATTGAACAAG 180
 40 CAAAAGAACG TTTAGCGCAA gCATTGCAAG ACATCAAAGA TTTAGTGAAA GCTAAAGAAG 240
 ATGCGAAAAA TGATATTGAT AAACGTGTAC AAGCTTTAAT TGACGAAATC GATCAAAATC 300
 CAAATCTAAC AGATAAGGAA AAACAAGCAC TTAAAGATCG AATTAATCAA ATACTTCAAC 360
 45 AAGGTCATAA CGACATTAAC AATGCGCTGA CTAAAGAAGA AATTGAGCAG GCAAAAGCAC 420
 AACTTGCACA AGCATTGCAA GACATCAAAG ATTTAGTGAA AGCTAAAGAA GATGCGAAAA 480
 50 ATGCAATAAA AGCCTTAGCT AATGCGAAGc GTGATCAAAT CAATTCAAAT CCAGATTTAA 540
 CACCTGAGCA AAAAGCAAAA GCGCTCAAAG AAATTGACGA AGCTGAAAAA CGAGCACTAC 600
 AAAACGTTGA GAATGCTCAA ACTATAGATC AATTAAATCG AGGATTAAAC TTAGGTTTAG 660

55

TTGAAGCAAC ACCTGAGCAA ATCCTAGTTA ATGGTGAAC TATTGTACAT CGTGATGACA 780
 TCATTACAGA ACAAGATATT CTTGCACACA TAAACTTAAT TGATCAGCTT TCAGCAGAAG 840
 5 TCATCGATAC ACCATCAACT GCAACGATTT CTGATAGCTT AACAGCAAAA GTTGAAGTTA 900
 CATTGCTTGA TGGATCAAAA GTGATTGTTA ATGTTCTGT AAAAGTTGTA GAAAAAGAAT 960
 TGTCAGTAGT CAAACAACAG GCAATTGAAT CAATCGAAAA TGCGGCACAA CAAAAGATTA 1020
 10 ATGAAATCAA TAATAGTGTG ACATTAACAC TGGAACAAAA AGAAGCTGCA ATTGCGnAAG 1080
 TTAATAAGCT TAAACAACAA GCAATTGGAT CATGTTnAAC AATGGCACCT GGATGTTCCA 1140
 15 TTCAGTTGAA GGAAATTTCA ACAACAAGGA ACAAGCGCCn GATTGGAACA ATTTGA 1196

(2) INFORMATION FOR SEQ ID NO: 72:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1519 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 72:

CAATCGTTTC AACGCTATTA TCTTTAGACA ACAATTGTAA GCGTGTATGT GCAGTTTCTA 60
 AACAGTCTAT AATTCGAGTT CTTAATTCAG CTGGATCATC TTTAAAAATA AAATCCATCG 120
 30 CTGCAACTTT GTAGACAAAT GTTAAATAGG TAAGTTCACT GTGACTCGTA ACGAAAATAA 180
 TGTTACCAAC TGGGTCATGC TTACGAATTT CACTGCCTAA TTTGATACCA TTAATATCAG 240
 35 TTGAAAGTTG AATATCTAAA AAGTAACAGC CTATGTCATT CATATTTTGA GCTTGCTCAA 300
 GCACCTCATA AGGATTATCA GTTGCGAGGG CAATTTCCAT AGGCTTTTCT TCTATCATT 360
 TATAATTTTT AATAATGGTA ACCATGTTTT CTCTTTGTTT TGGATCGTCT TCGCAAATGA 420
 40 AAATTTTCAT ACATTCACAT CCTTATGGCT AGTTGTTAAT AATTTCAACT TTTGAATAA 480
 AGAAACCATT TTCGATAATT GTATCTAATA AGACATTGTC TGCATTATCA GCAATTTCTT 540
 TTAAAGTTGA TAGACCTAAA CCACGACCTT CACCTTTAGT AGAAAACTT TCTTGAACA 600
 45 ATTCATGAAT GCGTGGTATA TCATCAGCGC ATTTATTCAT AACAATAAAC GTTACTGAAT 660
 TTTCACTTTC AATAAATGCA ACGCGAATGA TAGGGTCATC AATTTCAAGT GATGCCTCAA 720
 TTGCATTATC AAGAATAATA CCAATACTGC GACTTAAATC GATCATATTC AAGTTAATGC 780
 50 TACTTACTTC ATCGGGTATT TCGATACTAA TCGGAATATT CATTCTTGT GCACGTAAAA 840
 TTTTCGCAGT AATTAAGCCT TTAATTTTAC GTACTTTAAG ATTCTCGATA CCATTTAATT 900

GTAGGCCAGG CATGTCATCT TCTCGAATGT ATTCTGAAAG TGTCGTTAAG ATATTGACAT 1020
 AATCATGACG GAACTTGCGC ATTTCTGTTG TGATAGCTTC AATCTTCAAT GTATATTCAT 1080
 5 AATAGGTTTC AATTTCTTCT TGATTACGTT TATATTTTCAAT CTCTTTAAGG AGAAATTGAG 1140
 AAATAACAAA TGTTAATATA CTTAAAAATA TAGTGATACC AATAAAAAATA AAAGAATACT 1200
 GCCTTATTAC TTTAGCTTCA TCCGAGTTTA TTTGTGAATA AAAGAAAAAT AATGAAAAAG 1260
 10 TAAGCAGTAA GATAGTCGAA ATAACATTA AAAATCCTTT GTTTAGTATT AGATATGGTG 1320
 TGCTAATTTT TTTGAGAACT CTATTTATTA TATATGAGAA TAGTATACTA ATAGTCACAT 1380
 AAATAACAAA AAAGCTAGGG AATATTACAA ATATACTATC AGAAATTTTG GTGGATATAT 1440
 15 GCATATATAA CTATATACCT GTAGTTAGCA CnGThATAGG AATAATCnGG CGAGGTCCAT 1500
 AATCCACCAA AATAGAATA 1519

20 (2) INFORMATION FOR SEQ ID NO: 73:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 5445 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 25 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 73:

30 GTAGGAATCT CTTTGTCTTT TTGGGAGGAC ATTAAATATG AATGTATATT TAGCAGAATT 60
 CCTAGGAACT GCAATCTTAA TCCTTTTGG TGGTGGCGTT TGTGCCAATG TCAATTTAAA 120
 GAGAAGTGCT GCGAATGGTG CTGATTGGAT TGTCATCACA GCTGGATGGG GATTAGCGGT 180
 35 TACAATGGGT GTGTTTGCTG TCGGTCAATT CTCAGGTGCA CATTAAACC CAGCGGTGTC 240
 TTTAGCTCTT GCATTAGACG GAAGTTTGA TTGGTCATTA GTTCCTGGTT ATATTGTTGC 300
 TCAAATGTTA GGTGCAATTG TCGGAGCAAC AATTGTATGG TTAATGTACT TGCCACATTG 360
 GAAAGCGACA GAAGAAGCTG GCGCGAAATT AGGTGTTTTT TCTACAGCAC CGGCTATTAA 420
 GAATTACTTT GCCAACTTTT TAAGTGAGAT TATCGGAACA ATGGCATTAA CTTTAGGTAT 480
 45 TTTATTTATC GGTGTAAACA AAATTGCCGA TGGTTTAAAT CCTTTAATTG TCGGAGCATT 540
 AATTGTTGCA ATCGGATTAA GTTTAGGCGG TGCTACTGGT TATGCAATCA ACCCAGCAGG 600
 TGATTTAGGT CCGAGAATTG CACATGCGAT TTTACCAATA GCTGGTAAAG GTGGTTCAAA 660
 50 TTGGTCATAT GCAATCGTTC CTATCTTAGG ACCAATTGCC GGTGGTTTAT TAGGTGCAGT 720
 GGTATACGCT GTATTTTATA AACATACATT TAATATTGGT TGTGCAATTG CrATTGTTGT 780

55

	CGAATCAATT TACTAAAATA AAAAGAAACG TAAATAGCAT AATTTAACAT GTTTGATTCA	900
	TGGATTATGC TATTTTTCG CCAAATTTA ACAGATTTTG TACAATGGGT TAGCGATTAT	960
5	TTTTTAATAA AGGAGATACT ACTAATGGAA AAATATATTT TATCTATAGA CCAAGGAACA	1020
	ACAAGCTCAA GAGCGATTTT ATTCAATCAA AAAGGGGAAA TTGCAGGGGT AGCACAACGT	1080
	GAGTTTAAGC AATATTTTCC ACAATCAGGT TGGGTTGAAC ATGATGCAAA TGAAATTTGG	1140
10	ACATCTGTGT TAGCTGTAAT GACGGAAGTA ATTAATGAAA ATGATGTTAG AGCTGATCAA	1200
	ATTGCAGGTA TCGGTATTAC AAACCAACGT GAAACAACGG TTGTTTGGGA CAAaCATACT	1260
	GGCCGCCCAA TTTATCACGC AATTGTTTGG CAATCACGTC AAACACAATC AATTTGTTCA	1320
15	GAATTAAGC AACCAAGGATA TGAACAAACA TTTAGAGATA AGACAGGATT ACTTTTAGAT	1380
	CCGTATTTTG CAGGTACAAA AGTTAAATGG ATTCTAGACA ATGTTGAAGG TGCACGAGAA	1440
20	AAAGCAGAAA ATGGCGATCT ATTATTTGGA ACGATTGATA CTTGGTTAGT ATGGAAATTA	1500
	TCaGgAAAag CtGCGCATAT TACTGATTAT TCaAATGCGA GTCGTACATT AATGTTTAAT	1560
	ATCCATGATT TAGAATGGGA CGATGAGTTA TTAGAActat TACAGTACCT AAAAATATGT	1620
25	TGCCAGAAGT TAAAGCTTCG AGTGAAGTAT ATGGTAAGAC AATTGATTAC CACTTCTATG	1680
	GTCAAGAAGT ACCAATCGCT GGAGTAGCTG GTGATCAACA AGCAGCATTa TTTGGACAAG	1740
	CTTGCTTCGA ACGTGGTGAC GTGAAAAACA CATATGGAAC TGGTGGCTTC ATGTTAATGA	1800
30	ATACAGGTGA CAAAGCGGTT AAATCTGAAA GTGGTTTATT AACAACAATT GCTTATGGTA	1860
	TTGATGGAAA AGTAAATTAT GCGCTTGAAG GTTCCATCTT TGTTTCGGGT TCAGCAATCC	1920
	AATGGTTACG TGATGGATTA AGAATGATTA ATTCAGCACC ACAATCAGAA AGTTATGCGA	1980
35	CACGAGTTGA CTCTACTGAG GGTGTTTATG TTGTTCCAGC TTTTGTAGGT TTAGGAACAC	2040
	CATA ¹ TTGGGA TTCTGAAGCA CGTGGTGCGA TTTTCGGTTT AACACGTGGA ACTGAAAAAG	2100
	AGCACTTTAT CCGTGCAACT TTAGAATCAC TATGTTACCA AACTCGTGAC GTTATGGAAG	2160
40	CAATGTCAAA AGACTCTGGT ATTGATGTCC AAAGTTTACG TGTCGATGGT GGTGCAGTTA	2220
	AAAATAACTT TATTATGCAG TTCCAAGCAG ACATTGTTAA TACTTCTGTT GAAAGACCTG	2280
45	AAATTCAAGA AACTACAGCT TTAGGTGCTG CATTTTGGC AGGTTTAGCA GTTGGATTCT	2340
	GGGAGAGTAA AGATGATATC GCTAAAAACT GGAAATTAGA AGAAAAATTC GATCCGAAAA	2400
	TGGATGAAGG CGAAAGAGAA AAATTATATA GAGGTTGGAA AAAAGCTGTT GAAGCAACAC	2460
50	AAGTTTTTAA AACAGAATAA ACTTGTAGAT TAGACTTTTG TATAAACATT GTGATACAAT	2520
	CAATTTAAGT TAATATTTGA ATCGAGAAGC GAGAGATTTG TTCGAACATG TACAATTGAA	2580

55

	GCATTGTCTA CTTTAAAGAG AGAACATATT AAAAAGAATT TAAGAAATGA TGAATATGAT	2700
	TTAGTAATTA TTGGTGGCGG TATTACAGGT GCAGGTATTG CACTAGACGC GAGTGAAAGA	2760
5	GGAATGAAAG TTGCATTAGT TGAAATGCAA GACTTTGCAC AAGGAACAAG CTCAAGATCT	2820
	ACAAAATTAG TCCATGGTGG TTTGCGTTAC TTAAAACAAT TCCAAATTGG AGTAGTTGCC	2880
	GAAACTGGTA AAGAACGTGC GATTGTTTAT GAAAATGGGC CTCATGTTAC GACTCCAGAG	2940
10	TGGATGCTTT TACCAATGCA TAAAGGTGGA ACATTTGGA AATTCTCAAC ATCAATTGGT	3000
	TTAGGAATGT ATGATCGTTT AGCAGGTGTT AAGAAGTCTG AACGTAAAAA AATGTTATCT	3060
	AAAAAAGAAA CTTTAGCTAA AGAACCATTA GTTAAAAAAG AAGGTCTAAA AGGCGGCGGT	3120
15	TACTATGTTG AATATCGTAC TGACGATGCG CGTTTAACTA TTGAAGTTAT GAAGCGTGCT	3180
	GCTGAAAAAG GCGCAGAAAT TATCAACTAT ACTAAATCTG AACACTTCAC TTATGATAAA	3240
20	AATCAACAAG TAAATGGTGT TAAAGTTATA GATAAATTAA CTAATGAAAA TTATACAATT	3300
	AAGGCTAAAA AAGTGGTTAA TGCAGCAGGT CCATGGGTTG ATGATGTTAG AAGTGGTGAT	3360
	TATGCACGCA ATAATAAAAA ATTACGTTTA ACTAAAGGTG TACATGTTGT TATTGATCAA	3420
25	TCAAAATTCC CATTAGGTCA AGCAGTATAC TTTGATACTG AAAAAGATGG AAGAATGATT	3480
	TTTGCAATTC CACGTGAAGG AAAAGCGTAT GTAGGTACTA CAGATACATT CTATGACAAT	3540
	ATCAAATCTT CACCATTAAC TACACAAGAA GACAGAGACT ATTTAATCGA TGCGATTAAT	3600
30	TACATGTTCC CTAGTGTTAA TGTTACAGAT GAAGATATTG AATCAACATG GGCAGGAATT	3660
	AGACCATTAA TTTACGAAGA AGGCAAAGAC CCTTCTGAAA TCTCTCGTAA GGATGAAATT	3720
35	TGGGAAGGTA AATCAGGTTT ATTAAC TATT GCAGGTGGTA AATTAACAGG CTATCGTCAC	3780
	ATGGCTCAAG ACATTGTTGA TTTAGTATCT AAACGCTTGA AAAAAGACTA CGGTTTAAAC	3840
	TTTAGTCCAT GTAATACAAA AGGTCTGGCA ATTT CAGGTG GCGATGTAGG TGGTAGCAAG	3900
40	AACTTTGATG CGTTTGTTAGA GCAAAAAGTA GATGTAGCTA AAGGATTCGG CATTGATGAA	3960
	GATGTTGCAA GACGTTTAGC ATCTAAATAT GGTTCAAATG TTGATGAATT GTTCAACATT	4020
	GCGCAAACAT CTCAATACCA TGATAGCAAG TTACCATTAG AAATTTATGT AGAATTGTT	4080
45	TATAGTATTC AACAAGAAAT GGTATACAAA CCTAACGATT TCTTAGTTCG TCGTTCTGGT	4140
	AAAATGTATT TCAATATTAA AGATGTATTA GATTATAAAG ATGCTGTCAT CGATATTATG	4200
	GCAGATATGC TTGATTACTC TCCAGCTCAA ATTGAAGCAT ATACTGAAGA AGTTGAGCAA	4260
50	GCAATTAAAG AAGCGCAACA TGGaATAAT CAACCAGCAG TTAAAGAATA AtTAATTGT	4320
	ACAATCATAA ACTGGTGTCC TGTTTTAAGG GCATCAGTTT TTTTATACGA GATACATTAG	4380

55

GTTATTAAAG GTGTGAGATG ATGACTGAAA AACAAATTTAA ATTAAGTGTG CAAGATAATA 4500
 CGAATATTGA AGTTAAAGTG AATTTTACAG ATGTAGATTC AAAAGGAATT ATTCATATAT 4560
 5 TTCATGGTAT GGCTGAACAT ATGGAACGTT ACGATAAAAT AGCACATGCA CTTTCAAAGC 4620
 ATGGCTTCGA TGTGATACGT CATAATCATC GAGGACATGG TATTAATATT GATGAATCAA 4680
 CAAGAGGGCA TTACGATGAT ATGAAACGAG TTATCGGTGA TGCCTTTGAA GTAGCGCAAA 4740
 10 CAGTGAGAGG CAATGTTGAT AAACCATACA TTATAATCGG ACATTCAATG GGATCCGTTA 4800
 TAGCTAGATT GTTTGTAGAA ACATATCCGC AATATGTTGA TGGTCTAATT TTAAGTGGTA 4860
 CTGGTATGTA TTCATTATGG AAAGGTTTAC CAACCGTTAA AGTGTTACAA CTGATTACAA 4920
 15 AAATTTATGG TGCTGAGAAA CGAGTTGAAT GGGTTAACCA GTTAGTATCA AATAGTTTTA 4980
 ATAAAAAAT ACGTCCATTA CGTACACAAA GTGATTGGAT TTCTAGTAAT CCAATTGAAG 5040
 20 TAGATAACTT TATTAAAGAT CCATATAGTG GaTTTAATGT GTCAAATCAA TTATTATATC 5100
 AAACAGCCTA TTATATGCTA CATAATCAC AATTAAAAAA TATGAAAATG TTAAATCATG 5160
 CCATGCCTAT ATTATTAGTT TCAGGATATG ACGATCCTTT AGGTGATTAT GGTAAAGGGA 5220
 25 TTTTAAATTT GCGCAATATA TATAGAAACG CTGGCATTAa AAATGTTAAA GTGAATCTTT 5280
 ATCATCATAA ACGTCATGAA GTGTTATTTG AAAAaGATCA TGACaAAATT TGGGAAGACT 5340
 TGTTTAAATG GTTGAATCAA TTTTATAAAA AATAAAGAAA GTGGAATTAA ATATGAATAA 5400
 30 AAATAAGCCT TTTATTGTAG TAATTGTGGG GCCAACTGCT TGCAG 5445

(2) INFORMATION FOR SEQ ID NO: 74:

(1) SEQUENCE CHARACTERISTICS:
 35 (A) LENGTH: 2569 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 74:

TGGCTTGAAC TACGCCAATA AGTCCCCCTA GTACAAGAAT GAATACCATG ATATCGACCG 60
 45 CTTCTATCGT ACCTTCAACC ATGCTACTTG TTATTTGTTT TGGTCCAGCT GGATGTTGCT 120
 TTAATCTTTC ATAAGTATTC GGAATTGATA CCGGCTTATT AATTGCACCT GATTAAATTT 180
 GTTCAATCTT AATTTTAACC CCCATTTTGT CTAGTTCTCG TTGCGTACCC GGAACCTTTT 240
 50 TCACTTGGTT ATGAGGGTTA ACTATCTTTA GTTCTTGGGA TGAAGGTTTC TAAGAAAGTT 300
 TAGAATATGC ACCAGCAGGA ATAACCCATG TTGCTATAAC TGCAACAACC GTTAAATGA 360

55

EP 0 786 519 A2

	TAATTGTATT TTCCACGGTT TCATCTCCTT CGACATTTAA CCTAGCATT TCTACCTTAAA	480
	GATTTTATAA ATATAAATTA AGAAAGTGCA CCCCAGCATCA AAATAGAGGC ATTATTTTCA	540
5	GGGGGTGCAC ATAAATAATA AAAATCATGC ATTTGACATA TAGTAATTGA AAAGCGTTTC	600
	AATCAATTA CTTTTTAATC ACAGTACCTA CTTTACCCTC TAAGGCAGCA TCTAATTCAT	660
10	TTAATGATGT TATAAGCACA CTTCTTTTGG GATTGTTTTT AATAAATGAT ATGGCTGCTT	720
	CAATTTTTGG TAACATACTT CCTTTTGCAA ATTGATTTTC GTCTATATAT CGTTTTAATT	780
	CATCAACATT TGTTGTTTTT AAAGGCTGTT GGTTTTTCAGT GTTAAAATTA ATATATACAT	840
15	AATCAATTGC TGTTAAAATA ATCAATTGAT CGCATTGAAT ATTAGCACCC AACACGCAC	900
	TTGTTTTATC TTTGTCTATA ACTGCATCAA TACCTTTAAA ACCATCATGT TGCTCTCTAA	960
	TTACTGGTAT ACCTCCACCA CCAGCAGCAA TAACGAGTGT ATCATTTTTTA ATAAGTGTTT	1020
20	TAATACTCTC TAATTCAATA ATAGAGATGG GTTGTGGTGA AGGAACAACG CGTCTATATC	1080
	CTCTCCAGC ATCTTCAACA AATATAAATC CTTTTCTTTT TTGAATTTGT TCAGCTTCTT	1140
	CTTTGTTGTA AAATAACCCA ATTGGTTTTG AAGGATTGTT AAATGCCGGA TCATTTTCAT	1200
25	CAACTTCAAC TTGTGTCACT AGTGTACCA CTTGTTTATC CATTCCAATA GAATGCAATT	1260
	CATTTTGTA GCTTTCTTGT AATTGATAGC CGATGTAAGC TTGACTCATT GCGCCACATT	1320
	CAGCAAATGG AAATGCCGGA CCTTGTTTAT GTTCTGCAGC ATAGTTAAGT CCCAAATTAA	1380
30	TGCTTCCAAC CTGTGGTCCA TTACCATGAC TAATAACAAT CTCATGTCCT TTTGTTATTA	1440
	AyCCTACTAA TGATTtCGCA GTATTTTTAA CAAGCTCGAG TtGgTyCTTG aGGTGATTTn	1500
35	CCTAAAGCAT TACCACCTAA TGCTACTACT ATTTTCGCCA TCATATTCAC TTCCTTATAT	1560
	CATTTAAAT TCACCCAATG TAGCAACCAT GaCTGCTTTG ATTGTATGCA TtCTGTTCTC	1620
	AGCTTCTTGG AATACAAC TG AAGCTTTACT TTCGAATACT TCATCTGTAA CTTCATTTC	1680
40	TCGAATACCA TATTTTTCAA AAATTTGTTG ACCTATTTTC GTATCAGCAT TATGGAAAGA	1740
	TGGTAAGCAA TGCTCAAAAA TAACATTTGG ATTACCAGTT TTATCCATTA TTTCTTTATT	1800
	TACTTGATAT GGTTTCAATA ATTCAAGTCG TTCTTTCCAT ACTTCATCAG GTTCACCCAT	1860
45	TGATACCCAA ACATCAGTGT AAATTACATC CGAACCTTTT ACaCCTTGGT CaATATCATC	1920
	TGTGATTAAT ATGTTGCCaC CATTTTCaGC GGCAATATTT TTACAGCGAT TTAATAATTC	1980
50	ATCTGTTGGA TTTAATTCTT TTGGACAAAC TAAATGGAAG TTCATACCCA TAATGGCAGC	2040
	ACCTTGCAAT AATGCATTG CAACGTTATT ACGACCATCT CCAACATATG TAAAGTTAAT	2100
55	ATCTGCATAA TCTTTTTTTA AGACTTCTTT TGCTGTTAAG AAATCAGCAA GAACTTGAGT	2160

TTCTACTGTT CTTTGTGAAA AACCACGGTA TTCAATGCCA TCATACATTC CACCAAGCAC 2280
 ACGTGCAGTA TCTTTAGTTG TTTCTTTTTT ACCCATTTGT GATCCAGTTG GGCCTAAATA 2340
 5 AGTTACATTT GCACCTTGAT CATGCGCTGC AACTTCAAAT GCACATCGCG TTCTTGTAAG 2400
 ATCTTTTTCA AATAACAGTG CAATATTTTT ATTTTTTAAC ATAGGCTTTT CAGTGCCAAT 2460
 ATATTAGCA CGTTTTAAAT CCTCGGAGAG TGTTAATAAG GTTCTACCTC TTGTCGTGAA 2520
 10 AAGTCTAATA AAGTTAAAA ACTTCTGTTT CGTAAATTTT TCATTAANA 2569

(2) INFORMATION FOR SEQ ID NO: 75:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1273 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 75:

CCTGGAACCA TCCaATCGtG CaAATCtTgA AAGaGAATAC GCAACAACAA TTAAATGTAT 60
 25 TGGAACACTA TATTCCAAAT GACCATCCAG CACTCGTTGA ATTAAAAATA TGGGAACGTT 120
 GGTACATAA ACAAGGTTAC AAAGACATCC ATTTAGATAT TACTGCGCAC CACCTAGATC 180
 CTATTACACA GGTTTATTTA TTCAATGTCA TTTTGCTGAA AATGAATCTC GAGTTTTAAC 240
 30 AGGTGGTTAT TACAAAGGAA GCATCGAAGG GTTTGGATTA GGATTAACAC TTAAAGTAAG 300
 GGAGTATGCA CAATGTTAAG AATCGCCATA GCCAAAGGAC GTCTAATGGA TAGTTTAATT 360
 AACTATTTAG ATGTAATTGA ATATACGACA TTATCAGAAA CATTAAAAAA TAGAGAACGC 420
 35 CAATTATTAT TAAGTGTAGA TAATATTGAA TGCATTTTAG TAAAAGGAAG TGACGTGCCA 480
 ATCTATGTGG AACAAAGGAAT GGCAGACATA GGCATTGTTG GTAGCGACAT ATTAGATGAG 540
 40 CGCCAATATA ATGTTAATAA TTTGTTGAAT ATGCCTTTTG GAGCATGTCA TTTTGCGGTT 600
 GCAGCGAAAC CTGAAACGAC CAATTATCGT AAAATCGCAA CGAGTTATGT TCATACTGCT 660
 GAAACATATT TTAAATCAAA AGGTATTGAT GTCGAATTGA TTAAATTGAA TGGCTCTGTT 720
 45 GAATTGGCCT GTGTTGTAGA TATGGTAGAC GGAATTGTCTG ACATCGTTCA AACAGGTACT 780
 ACGCTAAAAG CGAACGGACT GGTGAAAAG CAACATATTA GTGATATCAA TGCAAGATTA 840
 ATAACATAA AAGCAGCTTA TTTTAAAAAA TCACAATTAA TAGAGCAATT TATTCGCTCT 900
 50 TTGGAGGTGT CTATTGCCAA TGCTTAATGC ACAACAATTT TTAAATCAAT TTTCAATAGA 960
 AGCACCATTA GATGAGTCAT TGTATCCaAT TATTCGCGAT ATTTGTCAGG AAGTTAAAGT 1020

TTTAGaAATT AGTCATGAmC AAATTAAAGC AGCATTTGAC ACATTAGATG AAAAAACAAA 1140
 ACAAGCATTa CAACAAAGTT ATGAAAGAAT TAnAGCATAT CAaGAAaGTA TtaAACAGaC 1200
 5 GaATCAACAG TTAGAAGaAT CAGTGGaGTG tTrTGaAATA TACCATCCmC taGaAAGTGT 1260
 CGGTATTTAT GTG 1273

(2) INFORMATION FOR SEQ ID NO: 76:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1308 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 76:

20 GTTGATAAAT TAAAAATGTT TTTATCAGAT ATTCAAAGTT ACCAACAATA TAGTAAAGAT 60
 CATCCGGTGT ATCAGTTAAT TGATAAATTT TATAATGATC ATTATGTTAT TCAATACTTT 120
 AGTGGACTTA TTGGTGGACG TGGACGACGT GCAAATCTTT ATGGTTTATT TAATAAAGCT 180
 25 ATCGAGTTTG AGAATTCAAG TTTTAGAGGT TTATATCAAT TTATTCGTTT TATCGATGAA 240
 TTGATTGAAA GAGGCAAAGA TTTTGGTGAG GAAATGTAG TTGGTCCAAA CGATAATGTC 300
 GTTAGAATGA TGACAATTCA TAGTAGTAAA GGTCTAGAGT TTCCATTTGT CATTTATTCT 360
 30 GGATTGTCAA AAGATTTTAA TAAACGTGAT TTGAAACAAC CAGTTATTTT AAATCAGCAA 420
 TTTGGTCTCG GAATGGATTA TTTTGATGTG GATAAAGAAA TGGCATTTC ATCTTTAGCT 480
 TCGGTTGCAT ATAGAGCTGT TGCCGAfAAA GAACTTGTGT CAGAAGAAAT GCGATTAGTC 540
 35 TATGTAGCAT TAACAAGAGC GAAAGAACAA CTTTATTTAA TTGGTAGAGT GAAAAATGAT 600
 AAATcATTAC TAGAACTAGA GCAATTGTCT ATTTCTGGTG AGCACATTGC TGTCAATGAA 660
 40 CGATTAACTT CACCAAATCC GTTCCATCTT ATTTATAGTA TTTTATCTAA ACATCAATCT 720
 GCGTCAATTC CAGATGATTT AAAATTTGAA AAAGATATAG CACAAATTGA AGATAGTAGT 780
 CGTCCGAATG TAAATATTTT AATTGTGTAC TTTGAAGATG TGTCTACAGA AACCATTTTA 840
 45 GATAATGATG AATATCGTTC GGTTAATCAA TTAGAACTA TGCAAAATGG TAATGAAGAT 900
 GTTAAAGCAC AAATTAAACA CCAACTTGAT TATCGATATC CATATGTAAA TGATACTAAA 960
 AAGCCCTCAA AACAACTCTGT TTCTGAATTG AAAAGACAAT ATGAAACAGA AGAAAGTGGC 1020
 50 ACAAGTTACG AACGAGTAAG GCAATATCGT ATCGGTTTTT CAACGTATGA ACGACCTAAA 1080
 TTTCTAAGTG AACAAGGTAA ACGAAAAGCG AATGAAATTG GTACGTTAAT GCATACAGTG 1140

GATGGATTAA TCGATAAACA TATTATCGAA GCAGATGCGA AAAAAGATAT CCGTATGGAT 1260
 GAAATAATGA CATTATCAAA TAGTGATTAT ATTCGATATT GCTGAAGC 1308

(2) INFORMATION FOR SEQ ID NO: 77:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1431 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 77:

GATGCCATTn ATnnGTATGC AAGAAGTTGT TCCGGGTTCA GGTGGATTaC CAGTTGGTAC 60
 TGGTGGTAAG ACGTTACTAA TGCTTTCAGG CCGTATAGAC TCACCAGTTG CTGGGATGGA 120
 AGTGATGAGA CGTGGCGTAA CAATTGAAGC GATTCATTTT CATAGTCCAC CATTTACAAG 180
 TGATCAAGCA AAAGAAAAAG TTATTGAATT GACACGTATT TTAGCTGAAC GTGTTGGACC 240
 AATTAAATTG CATATTGTAC CATTACAGA ATTGCAAAAA CAGGTAAATA AAGTTGTACA 300
 TCCAAGATAT ACAATGACTT CAACGAGACG TATGATGATG CGTGTGCTG ATAAATTAGT 360
 ACATCAAATA GGGGCTTTAG CTATTGTAAA TGGTGA AAC CTAGGGCAGG TAGCCAGTCA 420
 AACACTTCAT AGCATGTATG CAATTAATAA TGTAACCTCT ACTCCTGTAT TACGTCCTTT 480
 ATTAACCTAC GATAAAGAAG AAATTATTAT TAAATCGAAA GAAATTGGTA CATTTGAAAC 540
 ATCTATTCAA CCATTTGAAG ATTGTTGTAC AATTTTCACC CCTAAAAATC CAGTAACCGA 600
 ACCAAACTTT GATAAGGTAG TCCAATATGA AAGTGTCTTT GATTTTGAAG AGATGATTAA 660
 TCGTGCTGTT GAAATATTG AAACACTTGA AATAACTAGT GATTATAAAA CTATTAAAGA 720
 ACAGCAAACA AACCAATTAA TAAACGACTT TTTATAAATA AAATCCTAGA GTAAATTTAA 780
 ACATAAGGGG ATGTTAAACT ATGGATTTGA ACTTAACGAT GATTATAATC ATAATTTTAT 840
 TTGGTTTTAT CGCGGCGTTT ATAGATTCCG TTGTAGGGGG TGGCGGTTTA ATTTCTACGC 900
 CAGCATTATT AGCAATCGGT CTACCACCAT CTGTGGCTTT AGGTACAAAT AAATTGGCAA 960
 GTTCGTTTGG TTCTTTAACT AGTACGATAA AGTTTATAAG GTCCGGTAAA GTGGACTTAT 1020
 ATGTTGTTGC CAAATTATTT GGTTTTGTAT TTTTGGCATC TGCATGTGGC GCATATATTG 1080
 CAACGATGGT TCCGTCACAA ATATTGAAAC CTTAATCAT CATTGCACTT TCGTCGGTGT 1140
 TTATATTAC ATTACTTAAA AAAGATTGGG GCAATACACG CACGTTTACT CAATTTACAT 1200
 TTAAGAAAGC CATAATATTT GCAGCACTTT TTATATTAAT CGGCTTTTAT GATGGATTG 1260

TAAGTGCAGC AGGAAATGCT AAAGTTTTGA ACTTTGCTTC TAATATAGGT GCGCTTGAT 1380
TATTTATGGT ATTAGGACAA GTAGATTATG TAATAGGTTT AATTATGGCT A 1431

(2) INFORMATION FOR SEQ ID NO: 78:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4403 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 78:

AATATTATTT TAAATTCAAT ATTTATTGGT GCATTTATTT TAAACTTATT ATTCGCCTTT 60
ACCATTATTT TCATGGAAAG ACGTTCTGCC AATTCTATCT GGGCTTGGTT ACTAGTCTTA 120
GTTTTCTTGC CTTTATTCGG CTTCAATTTA TACTTACTAT TAGGACGACA AATTCACGTT 180
GACCAAATTT TCAAAATTGA TAAGGAAGAT AAAAAAGGAT TAGAGTTAAT CGTTGATGAG 240
CAATTAGCTG CTTTAAAAAA TGAAAACTTT TCAAAATCCA ATTATCAAAT TGTAATAATTT 300
AAAGAAATGA TTCAAATGTT GTTATATAAT AACGCAGCAT TTTTAACAAC AGACAACGAT 360
TTATTTTAT ACACAGACGG CCAAGAAAAA TTTGATGACC TAATACAAGA CATCCGTAAT 420
GCTACTGATT ATATTCATTT TCAGTACTAT ATTATTCAAA ATGATGAATT AGGTCGTACC 480
ATTTTAAATG AACTTGGTAA AAAAGCGGAA CAAGGTGTAG AAGTTAAAT TCTTTATGAT 540
GACATGGGTT CTCGTGGACT GCGTAAAAAA GGCTTACGCC CGTTTCGCAA TAAAGGTGGA 600
CATGCTGAAG CATTTTTCCC ATCAAAATTA CCTTTAATTA ACTTGCATAT GAACAATCGA 660
AACCATCGAA AAATTGTTGT AATAGATGGG CAAATTGGAT ATGTTGGTGG TTTAATGTT 720
GGTGATGAGT ACTTAGGTAA ATCAAAAAAA TTCGGCTATT GCGGAGATAC GCATTTACGA 780
ATTGTCGGGG ATGCAGTGAA TGCATTGCAA TTACGATTTA TTCTAGATTG GAATTCACAA 840
GCCACACGTG ACCACATCTC CTATGATGAT CGTTATTTCC CAGATGTAAA TTCTGGTGGA 900
ACAATTGGCG TTCAAATAGC TTCTAGTGGT CTGACGAAG AATGGGAACA GATTAAATAC 960
GGCTATTTGA AAATGATTTT ATCTGCTAAA AAATCGATTT ATATTCAATC TCCCTATTTT 1020
ATACCTGATC AAGCCTTTTT AGATTCTATT AAAATTGCGG CATTAGGTGG TGTGATGTC 1080
AATATCATGA TTCCTAATAA ACCTGACCAT CCGTTTGTTC TTTGGGCTAC TTTAAAAAAT 1140
GCAGCATCCT TATTAGATGC CGGTGTTAAA GTATTTCACT ACGACAATGG CTTTTTACAC 1200
TCAAAAACAC TTGTTATAGA TGATGAAATT GCAAGTGTGG GAACAGCTAA TATGGACCAT 1260

	AAATTAAAAC AAGCTTTTAT AGATGATTTA GCAGTATCTT CTGAATTAAC AAAAGCACGT	1380
	TATGCTAAGC GAAGTCTTTG GATTAAATTT AAAGAAGGTA TTTACAATT ATTGTCACCT	1440
5	ATCTTATAAA ATAGAAATAT GAGGAGTGTA aCTTTAATGC AACAATCAGA CGTCATTAGT	1500
	GCTGCCAAAA AATATATGGA ATCTATTCAT CAAAATGATT ATACAGGCCA TGATATTGCG	1560
	CATGTATATC GTGTCACGTC TTTAGCTAAA TCAATCGCTG AAAATGAAGG TGTTAATGAT	1620
10	ACTTTAGTCA TTGAACCTCG ATGTTTGCTT CATGATACCG TTGACGAAAA AGTTGTAGAT	1680
	GCTAACAAAC AATATGTTGA ATTGAAGTCA TTTTATCTT CTTTATCACT ATCAACCGAA	1740
15	GATCAAGAGC ACATTTTATT TATTATTAAT AATATGAGCT ATCGCAATGG CAAAAATGAT	1800
	CATGTCACCT TATCTTTAGA AGGTCAAATT GTCAGGGATG CAGATCGTCT TGATGCTATA	1860
	GGCGCTATAG GTGTTGCACG AACATTTCAA TTTGCAGGAC ACTTTGGTGA ACCTATGTGG	1920
20	ACAGAACATA TGTCACTAGA TAAGATTAAT GATGATTTAG TTGAACAGTT GCCACCATCT	1980
	GCAATTAAAC ATTTCTTTGA AAAATTACTT AAGTTAGAAT CTTAATGCA TACAGATACG	2040
	GCGAAGATGA TTGCTAAAGA ACGTCACGAC TTTATGATGA TGTAATTGAA ACAGTTTTTT	2100
25	ACGGAATGGA ATTGTCACGA CTAGACATTG AAGTTGTAGT ATGATGATGC GATGTAATGG	2160
	CGTGTGTTG TTGAAGCTTG GTGTCATGCC ATGTTACTTT GATGTGTTGT TGTGGGAGCT	2220
	TGGTGACATG TCATGCTACT TTGATGTGCT GGTACCACGA TCGTCTTGA TGTAGTGCTA	2280
30	TGATGTGGCA TTGCGGTGTT ATGGTGTAT AGACAGGTTT GCGGTTGATG CCATGTTACT	2340
	TTGATGTGCT GGTACCACGA TGCGACTTGA TGTAGTGCTA TGATGTGGCA TTGCGGTGTT	2400
35	ATGGTGTAT AGACCGGTTT GATGTTGATG CCATGTTACT TTGATGTGCT GGTGCTACGA	2460
	TGCGACTTGA TGTAGTGCTA TGATGTGGCG TTGCGCTGTT ATGGTGTAT AGCCAGGTTT	2520
	GGTGTGATG TCATGCCGTT ACGATTCTAT GATATGTTGT TGGGACGTTG CAATGTGTAT	2580
40	TATGCCGTTG TGACGTTATT ATTTCACT GTTACATGTA TAAGTGAATT GCTGTGAAA	2640
	TTTGCGACAT ATACTGCTAC ACTGATGAAT CATTGTGTCA AGATGACATT GCGATGAAGA	2700
	ATGACAACTC TGTTATTAAC CACTTTTTAC ATACTGAAAA CTCGTTAATA TTATTTCAAA	2760
45	TAAAAACAGC AGTAGGATGA CTTTCACATT TGAATCATC TTAATGCTGT TTCTATTTAT	2820
	CACATATTGT ATAATGTGAC ACTAAGTTTC GCTATTGAAG CGAAAAATAA TGTGCGCCCT	2880
	ATAAAGTTAA AATTATCTTC AACTTTTAGG GTGCACATTA TTTGGACTTG CTAAGGTTAT	2940
50	TTCTTTTCT TTTTAGACAC AACTTGTGTG TTTTGCCTT TTTTATTGct GCCGCCGTTG	3000
	TGCTCTCTTT CATACGCTTC AATGAAAGGT TGTACTTCTT TTTTAGCGAC TTTTTCATAA	3060

55

CCAAGTGCTG ATGCTGAGCT TAATGAAATC CAGATAATCA TAATTGGTGA AATGACCATC 3180
 ATCATGTAAC CCATTGACG TTGTTCTGCT GGCATCGTTT TACTTGATAC ATATGCTTGG 3240
 5 ATAAAGTATA AAACACCGGC AATAATTGTA ATCCAAATAT CAGGACGTCC TAAATCGAAC 3300
 CATAAGAAGT GTGGATATTT AAACAAACCA TCTACAAGTT GGTCTTTAAG TACAAAGTAT 3360
 AATCCCATGA TGATTGGTAA TTGGATTAGC ATTGGTAAAC AACCCAACAT ACTCTTAATC 3420
 10 GGGTTCATGT CATACTTTTT ATATACTTGC ATTAATTCTT GGTTCGAGC CATTTTTTCT 3480
 TCTGTGTAC GCGnCaCGTT CACTTTTTCT TGAATTTTTT CAACTTCTGG CTTTGCAACT 3540
 TTCATTTTTT GACGCATCAT ATGACTATTT TTATAGTTTG ACAACATGAA TGGAATAAAA 3600
 15 ATAATACGAA TTACCAATAC AAGGATAATA ATAGCTAAAC CATAATTGTC GTTAATAAAG 3660
 TTATTTCCCA ACCAATCCAA TACATTTTTC ATTGGATCTA CGAATGTATT GTAGAAAAAY 3720
 20 cWcLACGTTT TTCAGGTTTA GAATAGTCAC AACCAGCCAA AAAGACCATA ATACCTAAAA 3780
 ATAATGGTAG TAACGCTTTT TTCTTCATTT TTCCACCTCT ATCATTATAT TCACATAGGA 3840
 TTTATTCTAT CACATTAATG AGTACGTATG AAACAATAAG TGGAAAAATT TAACTAATTA 3900
 25 TTAAAAAAT CTTTGAATCG ATTAACAGTC TTTTCAATAT TTTCACTTTT AGAAATGGCT 3960
 GAAATGACTG AAATTCCATT GGCACCTGCT TCTACAATCG GCGCCACATT ATTAGTATTG 4020
 ATACCGCCAA TAGCTACAAT CGGTAGTTGC GGATTCATTT CTTTAAACGT TGCAATCATT 4080
 30 TCTGGACCTA CTGGTATATG CGCGTCATGC TTCGACGGCG TAGGATAGAT TGGTCCAACA 4140
 CCTATATAAT CmACATGAGT TAAATCAGAT TTTCATACT CATCTAAATC ACTAATACTA 4200
 AGTCCAATAA TTTTATCAGT GAAATATTGT GCTATCTCTT TGACTTTCGC ATCATCTTGA 4260
 35 CCGACATGTA TACCATCCGC GTTAATTTCT TTGCGCAAGG ATACATCATC ATTAACGATA 4320
 AAAGGCACAT CATATTGATG ACAGAGATGC TGTAATTCTT TAGCTAATAC AAGTTTATCG 4380
 40 TTTCTTTTA AAGCTGATTC ACC 4403

(2) INFORMATION FOR SEQ ID NO: 79:

(i) SEQUENCE CHARACTERISTICS:

- 45 (A) LENGTH: 1808 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 79:

50 TGGAnCCAAT ATTAGAAATG ATTAAACAT TAACAGGTAT TAATAGTCCT TCAGGAGnCA 60

55

TAACAAATAA AGGTGCGTTA TTAATAACAG TGCCAGGCAA AAATGATGAA GTACAACGCT 180
 GTATTACTGC TCATGTTGAT ACTTTAGGTG CaATGGTTAA AGAAATTAAA GAAGATGGTC 240
 5 GCTTaGCAAT AGAATTAATT GGAGGATTCA CGTATAACGC GATTGAGGGT GAATATTGCC 300
 AAATTAAAAC TGATGCTGGT CAAATATATA CAGGAACAAT TTGTCTGCAT GAAACAAGTG 360
 10 TTCATGTATA TAGAAATAAT CATGAAATAC CTAGAGATCA AAAGCATATG GAAATAAGAA 420
 TTGATGAAGT AACTACATCA GAAGAAGATA CAAAGAGTTT AGGTATTTCA GTAGGTGATT 480
 TTGTTAGCTT TGATCCACGT ACAGTTATCA CGTCATCAGG TTTTATTAAA TCTCGTCATT 540
 15 TAGATGATAA AGCTAGCGTA CGgTtGATAC TACAATTACT AAAGAAATTA AAAGAAGAGC 600
 AAATAATATT ACCACATACA ACGCAATTTT ATATTCTAA TAACGAAGAA ATAGGTTACG 660
 GTGCAAATGC ATCAATTGAT TCGAAAATCA AAGAATATAT TGCATTAGAT ATGGGCGCGT 720
 20 TGGGAGACGG TCAAGCATCG GATGAATATA CAGTTTCTAT TTGTGCCAAA GATGCTTCAG 780
 GTCCATATCA TAAGCAATTG AAATCGCACC TAGTTAATCT TTGCAAATA AATAACATTC 840
 CATATAAAGT AGACATATAT CCATATTATG GTTCAGATGC TTCAGCAGCT TTACATGCTG 900
 25 GTGCGGATAT CAGACATGGT TTATTTGGCG CTGGCATTGA ATCATCTCAT GCAATGGAAC 960
 GAACACATAT TGATTCTATT AAAGCGACAG AGAAATTACT ATATGCATAT TGCTTATCAC 1020
 CAATTGAGTA AACAATTAGT GTTGACAAAT GTGaACGACC TATGTAATAT AATGAACTAT 1080
 30 AAAAATAATT AGAATTTTCT AAAGAAATAG TAGCAGATAT GAAACGTAGC AAATAGAAAG 1140
 CTAATGGGTG ATGGGAATTA GCACGCCATA TCTTGTGAAT TGGACTTTGG AAAACAATTG 1200
 35 AATGAGTTTT GAAAGTGAAC ATGAATTATG TTAATAAGG TGGCACCACG GTAACGCGTC 1260
 CTTACAGGTA TATGCGTTAT GTGGTGTCTT TTTATTTAGA CAAAATGTAG TAGTTAATTA 1320
 AAGGTAGCAA CAGAAAGTTA GTGGATGATG TGAATAACA CCGAGATTAA TGAAATTGGG 1380
 40 TTTTGTCTGC AACAGAAAAA TTATATATAG TAAAGAGTGA ACTATGAATA TTTCGAATAT 1440
 TCGGTTAATT TAGGTGGTAC CACGCGTCac nTCCTTTATA TTGATAAGGA TGCTGGCGCT 1500
 TTTTGAAG GAGCGTATAG AATGGATATA TTTATAAAA AAATAAAAGC AAATGTAACG 1560
 45 CCCGAAGTTT TAGCACAAC TCAATCCAAG AAGaTCATTT TGGAAAGTAC AAATCAACAA 1620
 CAAACTAAAG GTCGCTATTC AGTTGTTATT TTTGATATTT ATGGCACTTT AACTTTAGAT 1680
 50 AATGATGTAT TATCAGTAAG TACTTTAAAA GAATCGTATC AAATCACTGA AAGACCGTAC 1740
 CATTATTTAA CGACTAAaAT AAATGAAGAC TACCATAATA TTCCAAGATG AGGCAACTTA 1800
 AGTCATTA 1808

55

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 1320 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 80:

10	TGGTCGTCAA TTTCTTGATT ATATCTATAA TCCTCATTTT CAATATTAGA GTCTGTAGAA	60
	TCATCGATAT TATTATCATT CGCATGACTA GAAGCAGAAT CATTATTTTT ATCATTGCTT	120
15	TCTTCTTTTT TGAAGTCTTT ATTTATCAAG TAAATTTCTT CATCAAAATC AGCTTGTTGA	180
	GATGTATCAT CTTTATTTTG ATTAGAAAAA TGTGTAGCCT TTGATCTTTT TCTTTGCCGT	240
	CTTTTCTTAG ATGTATTCCT CGTAAATAAT TCTAATTCAT CTTTATCTTC ATTTGATTCT	300
20	TGTTGATCGT TCTTCGTTTT ATCATCCATC AATACTCACA CCCTTTAATA AGATGGTAA	360
	TGGGCACGGA ATCTTTCAAT AAATTTCTCT CCACGCTCTT CAAAAGTACT ATATTGATCC	420
	CAACTCGCAC AAGCAGGTGA CAATAATACA ACATCATTTG GTTCTATAAT ATCTTGTA	480
25	TTATCAACAG CGTCTTCGAC ATTGTTGCT TCAATGACCG ATTCCCTTG ACTATTACCT	540
	AGTTTAGCAA ACTTAGCTTT CGTTTGTCG AATAACAACA TCGCGGAAC ATTTTCCATA	600
	TAAGGAATGA GTTCGTCAA TTCATTCCTT CGATCCAAAC CACCACATAA CCAAATGATT	660
30	GGTTGATTAA ATGAATTTAA GGCAAAGTGT GTTGCTAGCG TGTTTGTTGC TTGGAATCA	720
	TTATAATATT TATTAGTTCT ATTAGTACCA ACATATTGCA ATCTATGCTC TATTCCTGAA	780
35	AATGTAGTTA AACTATCAAT AATTGCTTTA ATAGGTACAC CAGCanaATA CAAGCAAGCA	840
	CAGCTGCTAA TATATTTcTA AATTATGTTT ACCAGGCAAT ACTAGAtCTT CAGTGTTAAT	900
	AATaCGAACA CCTTTATAaA CGATAAAACC ATCTTtAATA TAAaTACCAT CArCTtCTTG	960
40	TTGAGTTGAG AAATACAATG TCTTAGCTTT TAATTCTTCC GACTCTATCA CTTGTCTTTG	1020
	ATGATAATTA CAAATCAAAT AATCCTCTTC CGTTTGATTT TTATATATTT GCTTTTTAGC	1080
	ATTTTGATAG TTTTCTAAAT TTTTCATGGTA ATCTAGATGC GCCGAATAAA TGTTAGTAAT	1140
45	TATAGCAATG TGTGTTTAT ACTTTTCGAT TCCAAGTAAC TGGAATGACG ACAACTCTGT	1200
	AACTAAATAA TCTGTAGGCT TTACTTCTTG TGCTACTTTA GATGCAACAT AACCAATATT	1260
50	GCCGGATAAT CTTCCAGTTA AGCGACTTTT TTAAACATA TCTCCAATTA GAGAAGTAAC	1320

(2) INFORMATION FOR SEQ ID NO: 81:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 4280 base pairs

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 81:

	TTTACACCAA TCAAAAAATC GAACTGATAT AAATAAGTAC AAAGCTTATC TATCAATCCG	60
10	ATTTAGTTAT AAAACAAAAA AAGCCACAGT AATGTGGCTT TTTGTTATAT TCAGTATCAA	120
	AATGGTATCA ATAGCCATTT TCGGAAGTCA AGAATGGCTT AACAAACGCGG TTAAAGCTA	180
	TCCAATACTA CCTTCCATTT CGAACTTGAT TAAACGGTTC ATTTGACCG CGTATTCCAT	240
15	TGGAAGTTCT TTTGTAAATG GTTCGATGAA TCCATAACA ATCATTCTG TCGTTCTTC	300
	TTCAGAAATA CCACGACTCA TTAGATAGAA TAATTGTTCT TCAGAACTT TTGAAACCTT	360
	GGCTTCATGT TCTAATGATA TTTGATCGTT GAATACTTCG TTATATGGAA TTGTATCTGA	420
20	TGTTGATTCTG TTATCTAAGA TTAATGTATC ACATTCAATA TTTGAACGAG CACCTTTTGC	480
	TTTACGTCCA AAATGAACAA TACCGCGATA AATAACTTTA CCACCATTTT TAGAAATAGA	540
	TTTAGAAACA ATTGTAGAAG ATGTATTAGG TGCTTTATGA ATCATTTTAG CACCGGCATC	600
25	TTGAACTTGT CCTTTACCAG CAAATGCAAT AGATAATGTA CTACCTTTTG CACCTTCACC	660
	TAAAAGAACA CAGTTTGGAT ATTTCATCGT TAACCTAGAA CCTAAGTTAC CATCTACCCA	720
30	TTCCATATTT CCGTTTTTCAT AAACAAAAGT ACGTTTTGTA ACTAAATTGT ATACATTGTT	780
	CGCCCACTTT TGAATCGTAG TATAACGAAC GTGCGCATCT TTATGCACAA TGATTTCCAC	840
	AACAGCAGAG TGTAAAGAAC TAGTTGTATA AACTGGTGCA GTACAACCTT CTACGTAATG	900
35	TACAGAAGCA CCTTCATCAG CAATGATTAA TGTACGTTCA AATTGACCCA TGTCTCAGA	960
	GTTAATACGG AAATAAGCTT GTAGTGGCGT ATCTAGTTTG ATATTTTTAG GTACATAAAT	1020
	GAAAGAACCA CCTGACCATA CTGCTGAGTT TAACGCCGCA AATTGTTAT CTGCTGCAGG	1080
40	TACTACAGAA GCAAAGTATT TTTTGAATAA TTCTTCATTT TCTGTAAAG CACTATCTGT	1140
	ATCTTTAAAG ATAATACCTT TTTCTTCAAG TTCTTTTCC ATATTATGGT AAACAACCTC	1200
	AGATTCATAT TGAGCAGAAA CACCAGCTAA ATATTTTGT TCAGCTTCAG GAATTCCTAA	1260
45	TTTATCGAAA GTTCTTTTAA TTTCTTCTGG CACTTCATCC CATGAACGTT CAGCTTGTTT	1320
	TGAAGGCTTT ACATAGTAAG TAATGTCATC GAAATTCAAT TCTGATAAGT CGCCACCCCA	1380
50	TTGAGGCATT GGCATTTTAT AAAACAATTT TAATGATTTA AGACGGAAAT CTAACATCCA	1440
	TTCCGGCTCA TTTTTCATGT TAGAAATTTC TCTAACGATA TTCTCAGTTA AACCACGTTT	1500
	TGATCTGAAA ATGGACACAT CATCGTCGTG GAATCCATAT TTATAATCCC CAACATCAGG	1560

55

EP 0 786 519 A2

	TTTAATTCAT GATGTAAACC ATATTATAAC AATGACATGA CATCTTATAA AAATTTTAT	1680
	ACTTTTATAT GTCTAATATC AAAATTATCT ATGATTAACA GCATTCTATT CTTCTTCAGT	1740
5	CGTACCTTCT GCTTTACCTT CTTTAGCAAC AGTACCTTTT TCCAATGCTT TCCAAGCTAA	1800
	TGTGGCACAT TTAATACGAG CTGGGAATTG AGATACACCT TGCAATGCTT CAATATCTCC	1860
	CATTTCTTCT GTAATCACAT AGTCTTCACC AAGCATCATT TTCGTAAATT CTTGGCTCAT	1920
10	TTGCATTGCT TCTCCAAGTG AATGACCTTT AACAGCTTGT GTCATCATCG ATGCACTTGC	1980
	CATTGAAATC GAACAACCTT CACCTTCAAA CTTAGCATCT TTTATAATGC CGTCTTCTAT	2040
	ATCAAATGTT AGTCGTATAC GGTCAACGCA TGTCGGGTTA TTCATATCTA CTGTCATAGA	2100
15	CCC GTTATCT AATACACCTT TATTTCTAGG ATTTTATAA TGATCCATAA TGACAGATCT	2160
	ATATAATTGA TCTAGATTAT TAAAATTCAT AAGAGAAAAA CTCCTTCGTT TGTTC AAGG	2220
20	CATTTATTAA CTGATCAACG TCTTCTTTTG TGTGTATAT ATAAAACTC GCTCTAGCTG	2280
	TTGAAGACAC ATTTAACCAT TTCATTAACG GTTGCGCACA ATGATGCCCA GCTCTAACCG	2340
	CTACACCTTC TGTATCTACG GCTGTAGCAA CATCGTGTGG ATGTACATCT TGTAAATTAA	2400
25	ACGTTATTAC ACCTGCACGA CGATCCTTTG GCGGGCCATA AATTTCAATT CTTCAATTG	2460
	CAGACATTTG CTCATAAGCA TATATCGTTA ATTCTTGTTT ATATTATGA ATTGCATCAA	2520
	AACCTATGCG TTCTAAATAG CGAATAGCTT CTGCAAGCCC AATTGCTTGA GCAATTAATG	2580
30	GAGTACCCGC CTCAAATTTA GTAGGTAAAT CAGCCCATGT TGCATCATAC TTACTTACAA	2640
	AATCAATCAT GTCGCCACCG AACTCAATCG GTTCCATTTT TTGTAGTAAC TCACGTTTAC	2700
	CAAATAATAC GCCAATACCT GTTGGTCCAA GCATTTTATG ACCACTAAAA CTATAAAAA	2760
35	CAGCATTCAT TTCTGCATA TCAAGTTTCA TATGTGGTGC TGCTTGCGCC CCATCAACAC	2820
	TGATTAATTGC ACCATGTTGA TGAGCTATTT CTGCAATGGT TTTAACATCA TTAATTGTAC	2880
40	CGAGCACATT AGATATATGT GCAATAGCAA CGATCTTTGT TTTATCATT ATCGTTTGCT	2940
	TAATATCCTC GATGTTTAAT TCACCGTCAG CTGTCATTGG TATAAATTTT AATGTCGCAT	3000
	TTTTACGCTT TGCTAACTGT TGCCAAGGAA CAATATTGGC ATGATGTTCC ATTTCACTGA	3060
45	CAACAATTTT ATCGCCCTCT TCAACATTTG CATCACCATA GCTATGTGCT ACAAGGTTAA	3120
	TCGACGCAGT TGTTCCGCGT GTAAAAATGA TTTCTTCAAA ATACTTCGCA TTAATAAAAC	3180
	GACGAACGGT TTCACGGGCA TTTTCATAAC CATCAGTTGC CAATGATCCT AATGTATGAA	3240
50	CACCACGATG AACGTTTGAA TTATAACGCT TGTAGTAATC TTCTAAAACA TTTAACACTT	3300
	GCACAGGCGT TTGACTTGTC GCTGTTGAAT CAAGATATGC TAAACGTTTG CCATTGACTT	3360

55

5
 10
 15
 20
 25

CTTCATTAC	GACCTTTCTT	AAATAAAAAT	CCTAATCATT	TAAATACTGA	CGTTGTATTA	3480
GTCTTATACC	AATATCGACA	GTCTATATCT	ATTACAAACT	TTTATTTTCA	AAATATTATT	3540
TAGAAACTTT	GCGTTCAATT	ACTTCTCTCA	ATTGACGTTT	AACGTCTTCG	ATAGGTAATT	3600
CACGTACTAC	TGGATCTAAG	AAACCATGTA	TAACAAGACG	TTCCGCTTCT	CTTTGAGAAA	3660
TACCACGACT	CATTAAATAG	TAAAGTTGAT	CTGGATCAAC	ACGACCTACT	GATGCAGCAT	3720
GACCAGCTTG	TACATCATCT	TCATCAATTA	ATAAAATAGG	ATTGCGGTCA	CCACGAGCAT	3780
GTTCAGATAA	CATTAATACA	CGTGATTCTT	GATTAGCAAT	TGATTTAGTT	CCACCATGCT	3840
TAATGTAGCC	GATACCATTA	AATACAGACG	ATGCATGTTT	TTTCATAACA	CCATGTTTAA	3900
GGATATAACC	ATCTGTTTCT	TTACCATATT	GTACGATTTT	AGATGTTAGA	TTAATTTTTT	3960
GTTGCGCTGT	ACCTACAAC	ACTGATTTAA	GTGAACTTGT	TGAACGATCA	CCAAATAAAT	4020
TTGTTGTATT	ATCAATAATT	TGGCTACCCT	CATTCATTAA	ACCTAGTGCC	CAATTAATTG	4080
AGGCATCCGC	TTCAAGTAATA	CCACGTCGAA	TGATATGACC	TGTAAAGCCT	TTATCCATAT	4140
AGTCCACTGA	GCCATATGTG	ATATTTGAAT	TTGCACCAGC	AATCACTTCA	GAAATAATAT	4200
TtAATTGATT	TCCTTCACCA	GATGCATTTG	mTAAGTAATT	TTCAACATAT	GTGACTTCGG	4260
CGCTTTCTTC	AGTAACGATG					4280

(2) INFORMATION FOR SEQ ID NO: 82:

30
 35

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 15598 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 82:

40
 45
 50
 55

TChGACTCGA	ACGGTGmAAC	TAttCCGTTG	TaATTCCgGA	GgAAaCAAGG	TATGCCCATC	60
TGCaAAGAAA	gaATGsAATG	AACTTTTTGG	AAATGTAGAA	GTGGTAAATA	AAGATAAAGG	120
ATATTACATT	CTGAGAAGTA	TAAAAGCTTG	AAATGAAATG	GATATTCTGT	TATAGTTATA	180
TAATGTAAAA	ATTTATGTTT	AATAAGTGTG	TACTTTTACG	TTAAATAGAT	AAGTTAATTA	240
AGAATAAATA	TAGAATCGAA	AATGGTGTCA	TCATTAGTGT	TGCCGTTTTT	TTTTTGTCTT	300
TTTATTAATA	TGCTTATGGT	ATTTAGCTAA	AAGCGGATCA	CATAATTTTT	GAGGGGTGAA	360
TCTGTTTGGC	AGGTCAAGTT	GTCCAATATG	GAAGACATCG	TAAACGTAGA	AACTACGCGA	420
GAATTTTACA	AGTATTAGAA	TTACCAAACT	TAATAGAAAT	TCAAATAAAA	TCTTACGAGT	480

EP 0 786 519 A2

	CTGGTAATTT GTCATTAGAG TTTGTGGATT ACCGTTTAGG AGAACCAAAA TATGATTTAG	600
	AAGAATCTAA AAACCGTGAC GCTACTTATG CTGCACCTCT TCGTGTAATA GTGCGTCTAA	660
5	TCATTAAAGA AACAGGAGAA GTTAAAGAAC AAGAAGTCTT TATGGGTGAT TTCCCATTA	720
	TGACTGATAC AGGTACGTTT GTTATCAATG GTGCAGAACG TGTAAATCGTA TCTCAATTAG	780
	TTCGTTTACC ATCCGTTTAT TTCAATGAAA AAATCGACAA AAATGGTCGT GAAAACTATG	840
10	ATGCAACAAT TATTCCAAAC CGTGGTGCAT GGTTAGAATA TGAAACAGAT GCTAAAGATG	900
	TTGTATACGT ACGTATTGAT AGAACACGTA AACTACCATT AACAGTATTG TTACGTGCAT	960
15	TAGGTTTCTC AAGCGACCAA GAAATTGTTG ACCTTTTAGG TGACAATGAA TATTTACGTA	1020
	ATACTTTAGA GAAAGACGGC ACTGAAAACA CTGAACAAGC GTTATTAGAA ATCTATGAAC	1080
	GTTTACGTCC AGGTGAACCA CCAACTGTTG AAAATGCTAA AAGTCTATTG TATTCACGTT	1140
20	TCITTGATCC AAAACGCTAT GACTTAGCAA GCGTGGGTCG TTATAAAACA AACAAAAAAT	1200
	TACATTTAAA ACATCGTTTA TTTAATCAAA AATTAGCTGA GCCAATTGTA AATACTGAAA	1260
	CTGGTGAAAT TGTAGTTGAA GAAGGTACAG TGCTTGATCG TCGTAAATC GACGAAATCA	1320
25	TGGATGTACT TGAATCAAAT GCAAACAGCG AAGTGTGTTGA ATTGCATGGT AGCGTTATAG	1380
	ACGAGCCAGT AGAAATTCAA TCAATTAAAG TATATGTTCC TAACGATGAT GAAGGTGCGTA	1440
	CGACAACGT AATTGGTAAT GCTTTCCCTG ACTCAGAAGT TAAATGCATT ACACCAGCAG	1500
30	ATATCATTGC TTCAATGAGT TACTTCTTTA ACTTATTAAG CCGTATTGGA TATACAGATG	1560
	ATATTGACCA TTTAGGTAAC CGTCGTTTAC GTTCTGTAGG TGAATTACTA CAAAACCAAT	1620
	TCCGTATCGG TTTATCAAGA ATGGAAAGAG TTGTACGTGA AAGAATGTCA ATTCAAGATA	1680
35	CTGAGTCTAT CACACCTCAA CAATTAATTA ATATTGACC TGTATTGCA TCTATTAAAG	1740
	AATTTCTTGG TAGCTCTCAA TTATCACAAT TCATGGACCA AGCAAACCCA TTAGCTGAGT	1800
40	TAACGCATAA ACGTCGTCTA TCAGCATTAG GACCTGGTGG TTTAACACGT GAACGTGCTC	1860
	AAATGGAAGT ACGTGACGTT CACTACTCTC ACTATGGCCG TATGTGTCCA ATTGAAACAC	1920
	CTGAGGGACC AAACATTGGA TTGATTAAGT CATTATCAAG TTATGCACGT GTAAATGAAT	1980
45	TCGGCTTTAT TGAAACACCA TATCGTAAAG TTGATTTAGA TACACATGCT ATCACTGATC	2040
	AAATTGACTA TTTAACAGCT GACGAAGAAG ATAGCTATGT TGTAGCACAA GCAAACCTCTA	2100
	AATTAGATGA AAATGGTCGT TTCATGGATG ATGAAGTTGT ATGTCGTTTC CGTGGTAACA	2160
50	ATACAGTTAT GGCTAAAGAA AAAATGGATT ATATGGATGT ATCGCCGAAG CAAGTTGTTT	2220
	CAGCAGCGAC AgcATGTATT CCATTCTTAG AAAATGATGA CTCAAACCGT GCATTGATGG	2280

55

EP 0 786 519 A2

	CAGGTATGGA ACACGTTGCA GCACGTGATT CTGGTGCGGC TATTACAGCT AAGCACAGAG	2400
	GTCGTGTTGA ACATGTTGAA TCTAATGAAA TTCTTGTTG TCGTCTAGTT GAAGAGAACG	2460
5	GCGTTGAGCA TGAAGGTGAA TTAGATCGCT ATCCATTAGC TAAATTAAAA CGTTCAAAC	2520
	CAGGTACATG TTACAACCAA CGTCCAATCG TTGCAGTTGG AGATGTTGTT GAGTATAACG	2580
10	AGATTTTAGC AGATGGACCA TCTATGGAAT TAGGAGAAAT GGCATTAGGT AGAAACGTAG	2640
	TAGTTGGTTT CATGACTTGG GACGGTTACA ACTATGAGGA TGCCGTTATC ATGAGTGAAA	2700
	GACTTGTGAA AGATGACGTG TATACTTCTA TTCATATTGA AGAGTATGAA TCAGAAGCAC	2760
15	GTGATACTAA GTTAGGACCT GAAGAAATCA CAAGAGATAT TCCTAATGTT TCTGAAAGTG	2820
	CACTTAAGAA CTTAGACGAT CGTGGTATCG TTTATATTGG TGCAGAAGTA AAAGATGGAG	2880
	ATATTTTAGT TGGTAAAGTA ACGCCTAAAG GTGTAAGTGA GTTAAGTACC GAAGAAAGAT	2940
20	TGTTACATGC AATCTTTGGT GAAAAAGCAC GTGAAGTTAG AGATACTTCA TTACGTGTAC	3000
	CTCACGGCGC TGGCGGTATC GTTCTTGATG TAAAAGTATT CAATCGTGAA GAAGGCGACG	3060
	ATACATTATC ACCTGGTGTA AACCAATTAG TACGTGTATA TATCGTTCAA AACGTAAAA	3120
25	TTCAATGTTG TGATAAGATG TGTGGTCGAC ATGGTAACAA AGGTGTCATT TCTAAGATTG	3180
	TTCTGAAGA AGATATGCCT TACTTACCAG ATGGACGTCC GATCGATATC ATGTTAAATC	3240
	CTCTTGGTGT ACCATCTCGT ATGAACATCG GACAAGTATT AGAGCTACAC TTAGGTATGG	3300
30	CTGCTAAAAA TCTTGGTATT CACGTTGCAT CACCAGTATT TGACGGTGCA AACGATGACG	3360
	ATGTATGGTC AACAATTGAA GAAGCTGGTA TGGCTCGTGA TGGTAAAACT GTACTTTATG	3420
35	ATGGACGTAC AGGTGAACCA TTCGATAACC GTATTTTCACT AGGTGTAATG TACATGTTGA	3480
	AACTTGCGCA CATGGTTGAT GATAAATTAC ATGCGCGTTC AACAGGACCA TATTCACTTG	3540
	TTACACAACA ACCACTTGGC GGTAAAGCGC AATTCGGTGG ACAACGTTTT GGTGAGATGG	3600
40	AGGTATGGGC ACTTGAAGCA TATGGTGCTG CATAACATT ACAAGAAATC TTAAGTTACA	3660
	AATCCGATGA TACAGTAGGA CGTGTGAAAA CACACGAGGC TATTGTTAAA GGTGAAAACA	3720
	TCTCTAGACC AAGTGTCCA GAATCATTCC GAGTATTGAT GAAAGAAATTA CAAAGTTTAG	3780
45	GTTTAGATGT AAAAGTTATG GATGAGCAAG ATAATGAAAT CGAAATGACA GACGTTGATG	3840
	ACGATGATGT TGTAAGACGC AAAGTAGATT TACAACAAAA TGATGCTCCT GAAACACAAA	3900
	AAGAAGTTAC TGATTAATAC GCAATTTACA AAACAGGCAA AAAGATACTA AGCTGAATTT	3960
50	TATTGATGAT TCAGTTTAGT ACTTTAAGCC ATTTTAAATA AATGCAAATC AATCAAATAG	4020
	CACAGCTAAT CTAAATTGAA GGAGGTAGGC TCCTTGATTG ATGTAAATAA TTTCCATTAT	4080

55

EP 0 786 519 A2

	AAACCTGAAA CAATCAACTA CCGTACATTA AAACCTGAAA AAGATGGTCT ATTCTGTGAA	4200
	AGAATTTTCG GACCTACAAA AGACTGGGAA TGTAGTTGTG GTAAATACAA ACGTGTTCGC	4260
5	TACAAAGGCA TGGTCTGTGA CAGATGTGGA GTTGAAGTAA CTAAATCTAA AGTACGTCGT	4320
	GAAAGAATGG GTCACATTGA ACTTGCTGCT CCAGTTTCTC ACATTGGGTA TTTCAAAGGT	4380
	ATACCAAGTC GTATGGGATT ATTACTTGAC ATGTCACCAA GAGCATTAGA AGAAGTTATT	4440
10	TACTTTGCTT CTTATGTTGT TGTAGATCCA GGTCCAACCTG GTTTAGAAAA GAAAACCTTA	4500
	TTATCTGAAG CTGAATTCAG AGATTATTAT GATAAATACC CAGGTCAATT CGTTGCAAAA	4560
	ATGGGTGCAG AAGGTATTAA AGATTACTT GAAGAGATTG ATCTTGACGA AGAACTTAAA	4620
15	TTGTTACGCG ATGAGTTGGA ATCAGCTACT GGTCAAAGAC TTACTCGTGC AATTAAACGT	4680
	TTAGAAGTTG TTGAATCATT CCGTAATTCA GGTAACAAAC CTTTCATGGAT GATTTTAGAT	4740
20	GTACTTCCAA TCATCCCACC AGAAATTCGT CCAATGGTTC AATTAGATGG TGGACGATTT	4800
	GCAACAAGTG ACTTAAACGA CTTATACCGT CGTGTAATTA ATCGAAATAA TCGTTTGAAA	4860
	CGTTTATTAG ATTTAGGTGC ACCTGGTATC ATCGTTCAAA ACGAAAAACG TATGTTACAA	4920
25	GAAGCCGTTG ACGCTTTAAT TGATAATGGT CGTCGTGGTC GTCCAGTTAC TGGCCCAGGT	4980
	AACCGTCCAT TAAATCTTT ATCTCATATG TTAAAGGTA AACAAGGTCG TTTCCGTCAA	5040
	AACTTACTTG GTAAACGTGT TGACTATTCA GGACGTTTCA TTATTGCAGT AGGTCCAAGC	5100
30	TTGAAATGT ACCAATGTGG TTTACCAAAA GAAATGGCAC TTGAACTATT TAAACCATT	5160
	GTAATGAAAG AATTAGTTCA ACGTGAAATT GCAACTAACA TTAATAATGC GAAGAGTAAA	5220
	ATCGAACGTA TGGATGATGA AGTTTGGGAC GTATTGGAAG AAGTAATTAG AGAACATCCT	5280
35	GTATTACTTA ACCGTGCACC AACACTTCAT AGACTTGGTA TTCAAGCATT TGAACCAACT	5340
	TTAGTTGAAG GTCGTGCGAT TCGTCTACAT CCACTTGTA CAACAGCTTA TAACGCTGAC	5400
40	TTTGACGGTG ACCAAATGGC GGTTACGTT CCTTTATCAA AAGAGGCACA AGCTGAAGCA	5460
	AGAATGTTGA TGTTAGCAGC ACAAACATC TTGAACCCTA AAGATGGTAA ACCTGTAGTT	5520
	ACACCATCAC AAGATATGGT ACTTGSTAAC TATTACCTTA CTTTAGAAAG AAAAGATGCA	5580
45	GTAAATACAG GCGCAATCTT TAATAATACA AATGAAGTAT TAAAAGCATA TGCAAATGGC	5640
	TTTGATACATT TACACACTAG AATTGGTGTA CATGCAAGTT CGTTCAATAA TCCAACATTT	5700
	ACTGAAGAAC AAAACAAAAA GATTCTTGCT ACGTCAGTAG GTAAAATTAT ATTCAATGAA	5760
50	ATCATTCCAG ATTCATTTGC TTATATTAAT GAACCTACGC AAGAAAACTT AGAAAGAAAG	5820
	ACACCAAACA GATATTTTCAT CGATCCTACA ACTTTAGGTG AAGGTGGATT AAAAGAATAC	5880

55

EP 0 786 519 A2

	GAAGTATTCA ACAGATTTAG CATCACTGAT ACATCAATGA TGTTAGACCG TATGAAAGAC	6000
	TTAGGATTCA AATTCTCATC TAAAGCTGGT ATTACAGTAG GTGTTGCTGA TATCGTAGTA	6060
5	TTACCTGATA AGCAACAAAT ACTTGATGAG CATGAAAAAT TAGTCGACAG AATTACAAAA	6120
	CAATTCAACC GTGGTTTAAT CACTGAAGAA GAAAGATATA ATGCAGTTGT TGAAATTTGG	6180
	ACAGATGCAA AAGATCAAAT TCAAGGTGAA TTGATGCAAT CACTTGATAA AACTAACCCA	6240
10	ATCTTCATGA TGAGTGATTC AGGTGCCCCG GGTAAACGCAT CTAACTTTAC ACAGTTAGCA	6300
	GGTATGCGTG GATTGATGGC CGCACCATCT GGTAAGATTA TCGAATTACC AATCACATCT	6360
	TCATTCCGTG AAGGTTTAAC AGTACTTGAA TACTTCATCT CAACTCACGG TGCACGTAAA	6420
15	GGTCTTGCCG ATACAGCACT TAAAACAGCT GACTCAGGAT ATCTTACTCG TCGTCTTGTT	6480
	GACGTGGCAC AAGATGTTAT TGTTCTGTAA GAAGACTGTG GTACTGATAG AGGTTTATTA	6540
20	GTTTCTGATA TTAAAGAAGG TACAGAAATG ATTGAACCAT TTATCGAACG TATTGAAGGT	6600
	CGTTATTCTA AAGAAACAAT TCGTCATCCT GAAACTGATG AAATAATCAT TCGTCCTGAT	6660
	GAATTAATTA CACCTGAAAT TGCTAAGAAA ATTACAGATG CTGGTATTGA ACAAATGTAT	6720
25	ATTCGCTCAG CATTTACTTG TAACGCACGA CATGGTGTTT GTGAAAAATG TTACGGTAAA	6780
	AACCTTGCTA CTGGTGAAAA AGTTGAAGTT GGTGAAGCAG TTGGTACAAT TGCAGCCCAA	6840
	TCTATCGGTG AACCAGGTAC ACAGCTTACA ATGCGTACAT TCCATACAGG TGGGGTAGCA	6900
30	GGTAGCGATA TCACACAAGG TCTTCTCGT ATTCAAGAGA TTTTCGAAGC ACGTAACCT	6960
	AAAGGTCAAG CGGTAATTAC GGAAATCGAA GGTGTCGTAG AAGATATTAA ATTAGCAAAA	7020
	GATAGACAAC AAGAAATTGT TGTTAAAGGT GCTAATGAAA CAAGATCATA CCTTGCTTCA	7080
35	GGTACTTCAA GAATTATTGT AGAAATCGGT CAACCAGTTC AACGTGGTGA AGTATTAACT	7140
	GAAGGTTCTA TTGAACCTAA GAATTACTTA TCTGTTGCTG GATTAAACGC GACTGAAAGC	7200
	TACTTATTAA AAGAAGTACA AAAAGTTTAC CGTATGCAAG GTGTAGAAAT CGACGATAAA	7260
40	CACGTTGAGG TTATGGTTCG ACAAATGTTA CGTAAAGTTA GAATTATCGA AGCAGGTGAT	7320
	ACGAAGTTAT TACCAGGTTT ATTAGTTGAT ATTCATAACT TTACAGATGC AAATAGAGAA	7380
45	GCATTTAAAC ACCGTAAGCG TCCTGCAACA GCTAAACCAG TATTACTTGG TATTACTAAA	7440
	GCATCACTTG AAACAGAAAG TTTCTTATCT GCAGCATCAT TCCAAGAAAC AACAAGAGTT	7500
	CTTACAGATG CAGCAATTAA AGGTAAGCGT GATGACTTAT TAGGTCTTAA AGAAAACGTA	7560
50	ATTATTGGTA AGTTAATTCC AGCTGGTACT GGTATGAGAC GTTATAGCGA CGTAAAATAC	7620
	GAAAAACAG CTAAACCAGT TGCAGAAGTT GAATCTCAA CTGAAGTAAC GGAATAACAA	7680

55

EP 0 786 519 A2

	ATGTTGACGA ATTCTCTTGT TCAATGTTAA TATATTAAAG GTTGATGCAA GCAGAACTTT	7800
	GGAGGATAAA TTATTGTCTA AGGAAAAAGT tGCACGCTTT AACAAACAAC ATTTTGTAGT	7860
5	TGGTCTTAAA GAAACGCTTA AAGCGTTAAA GAAAGATCAA GTTACATCTT TGATTATTGC	7920
	TGAAGACGTT GAAGTATATT TAATGACTCG CGTGTTAAGC CAAATCAATC AGAAAAATAT	7980
	ACCTGTATCT TTTTCAAAA GCAAACATGC TTTGGGTAAA CATGTAGGTA TTAACGTCAA	8040
10	TGCGACAATA GTAGCATTGA TTAAATGAGA ATTAGTAAGT GTTTTACTTA CTAAATTTTA	8100
	TTTAACCTAA AAATGAACCA CCTGGATGTG TGGGATTAAA AAGTGAAGAG AGGAGGACAT	8160
	ATCACATGCC AACTATTAAC CAATTAGTAC GTAAACCAAG ACAAAGCAAA ATCAAAAAAT	8220
15	CAGATTCTCC AGCTTTAAAT AAAGGTTTCA ACAGTAAAAA GAAAAAATTT ACTGACTTAA	8280
	ACTCACCACA AAAACGTGGT GTATGTACTC GTGTAGGTAC AATGACACCT AAAAAACCTA	8340
20	ACTCAGCGTT ACGTAAATAT GCACGTGTGc gTtTATCAAA CAACATCGAA ATTAACGCAT	8400
	ACATCCCTGG TATCGGACAT AACTTACAAG AACACAGTGT TGTACTTGTA CGTGGTGGAC	8460
	GTGTAAAAGA CTTACCAGGT GTGCGTTACC ATATTGTACG TGGAGCACTT GATACTTCAG	8520
25	GTGTTGACGG ACGTAGACAA GGTGTTTCAT TATACGGAAC TAAGAAACCT AAAAACTAAG	8580
	AATTTAGTTT TTAATTAAAT CTTAACTTA AAATATTAA TATAAGGAAG GGAGGATTTA	8640
	CATTATGCCT CGTAAAGGAT CAGTACCTAA AAGAGACGTA TTACCAGATC CAATTCATAA	8700
30	CTCTAAGTTA GTAATAAAT TAATTAACAA AATTATGTTA GATGGTAAAC GTGGAACAGC	8760
	ACAAAGAATT CTTTATTAG CATTGACCT AGTTGAACAA CGCAGgtTCG TGATGCATTA	8820
	GAAGTATTCG AAGAAGCAAT CAACAACATT ATGCCAGTAT TAGAAGTTAA AGCTCGTCGC	8880
35	GTAGGTGGTT CTAACATCA AGTACCAGTA GAAGTTCGTC CAGAGCGTCG TACTACTTTA	8940
	GGTTTACGTT GGTTAGTTAA CTATGCACGT CTTGCTGGTG AAAAAACGAT GGAAGATCGT	9000
40	TTAGCTAACG AAATTTTAGA TGCAGCAAAT AATACAGGTG GTGCCGTTAA GAAACGTGAG	9060
	GACACTCACA AAATGGCTGA AGCAAACAAA GCATTTGCTC ACTACCGTTG GTAAGATAAA	9120
	AGCTTTTACC CTGAGTGTGT TCTATATTAA TGAATTTTCA TTAAGCGTTC ATGCTTAGGG	9180
45	CATCGCCATA TCTATCGTAT TTATTCAGTA ATATAAACTG GAAGGAGAAA AAATACATGG	9240
	CTAGAGAATT TTCATTAGAA AAAACTCGTA ATATCGGTAT CATGGCTCAC ATTGATGCTG	9300
	GTAAAACGAC TACGACTGAA CGTATTCTTT ATTACACTGG CCGTATCCAC AArGknGGTG	9360
50	AAaCACACGA AGGTGCTTCA CAAATGGACT GGATGGAGCA AGAACAAGAC CGTGGTATTA	9420
	CTATCACATC TGCTGCAACA ACAGCAGCTT GGAAGGTCA CCGTGTAAC ATTATCGATA	9480
55		

EP 0 786 519 A2

	CAGTTACAGT	ACTTGATGCA	CAATCAGGTG	TTGAACCTCA	AACTGAAACA	GTTTGGCGTC	9600
	AGGCTACAAC	TTATGGTGTT	CCACGTATCG	TATTTGTAAA	CAAAATGGAC	AAATTAGGTG	9660
5	CTAACTTCGA	ATACTCTGTA	AGTACATTAC	ATGATCGTTT	ACAAGCTAAC	GCTGCTCCAA	9720
	TCCAATTACC	AATTGGTGCG	GAAGACGAAT	TCGAAGCAAT	CATTGACTTA	GTTGAAATGA	9780
	AATGTTTCAA	ATATACAAAT	GATTTAGGTA	CTGAAATTGA	AGAAATTGAA	ATTCCTGAAG	9840
10	ACCACTTAGA	TAGAGCTGAA	GAAGCTCGTG	CTAGCTTAAT	CGAAGCAGTT	GCAGAAACTA	9900
	GCGACGAATT	AATGGAAAAA	TATCTTGGTG	ACGAAGAAAT	TTCAGTTTCT	GAATTAAAAG	9960
15	AAGCTATCCG	CCAAGCTaCt	AcTAACGTAG	AATTCTACCC	AGTACTTTGT	GGTACAGCTT	10020
	TCAAAAACAA	AGGTGTTCAA	TTAATGCTTG	ACGCTGTAAT	TGATTACTTA	CCTTCACCAC	10080
	TAGACGTTAA	ACCAATTATT	GGTCACCGTG	CTAGCAACCC	TGAAGAAGAA	GTAATCGCGA	10140
20	AAGCAGACGA	TTCAGCTGAA	TTGCTGTCAT	TAGCGTTCAA	AGTTATGACT	GACCCTTATG	10200
	TTGGTAAATT	AACATTCTTC	CGTGTGTATT	CAGGTACAAT	GACATCTGGT	TCATACGTTA	10260
	AGAACTCTAC	TAAAGGTAAA	CGTGAACGTG	TAGGTCGTTT	ATTACAAATG	CACGCTAACT	10320
25	CACGTCAAGA	AATCGATACT	GTATACTCTG	GAGATATCGC	TGCTGCGGTA	GGTCTTAAAG	10380
	ATACAGGTAC	TGGTGATACT	TTATGTGGTG	AGAAAAATGA	CATTATCTTG	GAATCAATGG	10440
	AATTCCCAGA	GCCAGTTATT	CACTTATCAG	TAGAGCCAAA	ATCTAAAGCT	GACCAAGATA	10500
30	AAATGACTCA	AGCTTTAGTT	AAATTACAAG	AAGAAGACCC	AACATTCCAT	GCACACACTG	10560
	ACGAAGAAAC	TGGACAAGTT	ATCATCGGTG	GTATGGGTGA	GCTTCACTTA	GACATCTTAG	10620
	TAGACCGTAT	GAAGAAAGAA	TTCAACGTTG	AATGTAACGT	AGGTGCTCCA	ATGGTTTCAT	10680
35	ATCGTGAAAC	ATTCAAATCA	TCTGCACAAG	TTCAAGGTAA	ATTCTCTCGT	CAATCTGGTG	10740
	GTCGTGGTCA	ATACGGTGAT	GTTACATTG	AATTCACACC	AAACGAAACA	GGCGCAGGTT	10800
40	TCGAATTCTGA	AAACGCTATC	GTTGGTGGTG	TAGTTCCTCG	TGAATACATT	CCATCAGTAG	10860
	AAGCTGGTCT	TAAAGATGCT	ATGGAAAATG	GTGTTTTAGC	AGGTTATCCT	TTAATTGATG	10920
	TTAAAGCTAA	ATTATATGAT	GGTTCATACC	ATGATGTCGA	TTCATCTGAA	ATGGCCTTCA	10980
45	AAATTGCTGC	ATCATTAGCA	CTTAAAGAAG	CTGCTAAAAA	ATGTGATCCT	GTAATCTTAG	11040
	AACCAATGAT	GAAAGTAACT	ATTGAAATGC	CTGAAGAGTA	CATGGGTGAT	ATCATGGGTG	11100
	ACGTAACATC	TCGTCGTGGA	CGTGTTGATG	GTATGGAACC	TCGTGGTAAT	GCACAAGTTG	11160
50	TTAATGCTTA	TGTACCACTT	TCAGAAATGT	TCGGTTATGC	AACATCATT	CGTTCAAACA	11220
	CTCAAGGTCG	CGGTACTTAC	ACTATGTACT	TCGATCACTA	TGCTGAAGTT	CCaAAATCaA	11280
55							

EP 0 786 519 A2

	GCCTAGGTTA AAATACAAGG TGAGCTTAAA TGTAAGCTAT CATCTTTATA GTTTGATTTT	11400
	TTGGGGTGAA TGCATTATAA AAGAATTGTA AAATCTTTT TGCATCGCTA TAAATAATTT	11460
5	CTCATGATGG TGAGAACTA TCATGAGAGA TAAATTTAAA TATTATTTTT AATTAGAATA	11520
	GGAGAGATTT TATAATGGCA AAAGAAAAAT TCGATCGTTC TAAAGAACAT GCCAATATCG	11580
	GTAATATCGG TCACGTTGAC CATGGTAAAA CAACATTAAC AGCAGCAATC GCTACTGTAT	11640
10	TAGCAAAAAA TGGTGACTCA GTTGACAAAT CATATGACAT GATTGACAAC GCTCCAGAAG	11700
	AAAAAGAAGC TGGTATCACA ATCAATACTT CTCACATTGA GTACCAAACT GACAAACGTC	11760
15	ACTACGCTCA CGTTGACTGC CCAGGACACG CTGACTACGT TAAAAACATG ATCACTGGTG	11820
	CTGCTCAAAT GGACGGCGGT ATCTTAGTAG TATCTGCTGC TGACGGTCCA ATGCCACAAA	11880
	CTCGTGAACA CATCTTTTTC TCACGTAACG TTGGTGTACC AGCATTAGTA GTATTCTTAA	11940
20	ACAAAGTTGA CATGGTTGAC GATGAAGAAT TATTAGAATT AGTAGAAATG GAAGTTCGTG	12000
	ACTTATTAAG CGAATATGAC TTCCAGGTG ACGATGTACC TGTAATCGCT GGTTCAGCAT	12060
	TAAAAGCTTT AGAAGGCGAT GCTCAATACG AAGAAAAAAT CTTAGAATTA ATGGAAGCTG	12120
25	TAGATACTTA CATTCCAACCT CCAGAACGTG ATTCTGACAA ACCATTTCATG ATGCCAGTTG	12180
	AGGACGTATT CTCAATCACT GGTCGTGGTA CTGTTGCTAC AGGCCGTGTT GAACGTGGTC	12240
	AAATCAAAGT TGGTGAAGAA GTTGAAATCA TCGGTTTACA TGACACATCT AAAACAACCTG	12300
30	TTACAGGTGT TGAATGTTC CGTAAATTAT TAGACTACGC TGAAGCTGGT GACAACATTG	12360
	GTGCATTATT ACGTGGTGTT GCTCGTGAAG ACGTACAACG TGGTCAAGTA TTAGCTGCTC	12420
	CTGGTTCAAT TACACCACAT ACTGAATTCA AAGCAGAAGT ATACGTATTA TCAAAGACG	12480
35	AAGGTGGACG TCACACTCCA TTCTTCTCAA ACTATCGTCC ACAATTCTAT TTCCGTACTA	12540
	CTGAEGTAAC TGGTGTGTT CACTTACCAG AAGGTACTGA AATGGTAATG CCTGGTGATA	12600
	ACGTTGAAAT GACAGTAGAA TTAATCGCTC CAATCGCGAT TGAAGACGGT ACTCGTTTCT	12660
40	CAATCCGTGA AGGTGGACGT ACTGTAGGAT CAGGCGTTGT TACTGAAATC ATTAAATAAT	12720
	TTCTAATTTC TTAGATTTTA TATAAAAAGA AGATCCCTCA ATCGAGGGG CTTTTTTTAA	12780
45	TGTGTAAATT TTGTAATGGC TATTCGATTT AGAAGAACAA TAATTGATGA AAGACTGACT	12840
	AATAAACTT ATAAGTGATA ATACTGTTTA AATAAAATTG TTGAGTCTTG GACATTGTAA	12900
	AATGCTCCCT TCAAAGTTTT CATTTTTTCA ATGTCTACTT TGAAGGGAGC ATTTTCATTAG	12960
50	TTTATGTCTC AGATTCATAT CTTTCAATTA ATTTAAATGC TTAATTTGTT TTAAATACCT	13020
	GCTCTAATTC TATGATTTTT AAAAATACAG CTACAGCGTA TTTAATGAT TTTTCATCAA	13080

55

EP 0 786 519 A2

	TCAGAAAGAA TGCACCTGGT CGTACTTTCA AATAATGTGA AAAATCTTCT CCAATCATCA	13200
	TTAAATCTGA TTCATTAAAG CGTACATGTA AGTCATTTGT TGCTTCTTTA ATAACITGAT	13260
5	ATGCTTTCTC GTTATTATGG ACAGGCAAAT ACCCTTTAAT ATAATTCAAA TCATAGTTAA	13320
	TATCATTTGC TATTGCTAAA CCTGTAGAA GCTTATCCAT TTTGTCCATT ACATGATTCT	13380
	GTATATCTGA ATCGAAAGTT CTAAGTGTAC CTTTACAAA TGCTTGATCA GGAATAACGC	13440
10	TATCTGTGGT GCCTGCTTGA ATCATTCCAA ATGAAAGTAC AGCTTGTTTA ACTGGATCGA	13500
	TCGTACGTGA AATTATTTTT TGTGCACTTA AAATGAACTC TGCCATGATT ACTATTGGGT	13560
	CAATGGTTTC ATGAGGTTTG GCACCATGAC CACCACGACC TTAAATGTG ACGCTAAATT	13620
15	CATCTGGAGA GGCCATGATT GCGCCGCAC GTGAATGAAT AGTTCAGTA GGATAACCAC	13680
	TCCATAAATG TGTACCGTAA ATTCTATCTA CATTTTCCAG ACATCCAGCA TCTATCATT	13740
	CTTGAGAACC ACCTGGCATG ATTTCTTCAC CGTACTGGAA TATTAATACA ACATTACCTT	13800
20	CTAATAAATG TTTATGTTCA TCTAAAATCT CTGCTACAGT AAGTAAATTT GCTGTATGAC	13860
	CATCATGCCC ACACGCATGC ATACATCCTG GATTTTTAGA CTTATAAGGC ACATCGTTTA	13920
25	ATTCCTCGAC AGGTAACGCA TCAAAGTCAG CTCTTAATGC AATGGTAGGT CCTGTGCCCC	13980
	AGCCTTTAAA TGTGGCTTTG ATACCATTGC GGCCGATAGG AGTTTCAATA TCACAAGATA	14040
	ACTGGCTTAA TTGGTTAACA ATATAATCAT GTGTTTGAAA TTCTTCAAAA GATAACTCAG	14100
30	GATATTGGTG TAAATAACGT CTGAGTTGAA TTGTTTTATT TTCTTTATTA TTTGCTAGTT	14160
	GGAACCAATC TAACACCCTT ATCACTACTT TCTAAAATAA TGTTTATAGT ATAACATTTT	14220
	ATGAAATTAT CGTACTAAAT GATTGCTTTG AGATATTTTA TCTATGAATG ATAAGGCTTT	14280
35	CAAGTTATGT AGAATTACTG TATGATAAAG GTATTACCAA ACAATACTTA AGGGGGATTA	14340
	TATACTGTGG TTCAATCATT ACATGAGTTT TTAGAGGAAA ATATAAATTA TCTAAAAGAA	14400
	AATGGTTTGT ATAATGAAAT AGATACAATT GAAGGTGCAA ACGGACCAGA AATCAAAATC	14460
40	AATGGGAAAT CATACTTAA CTTATCTTCA AATAATTATT TAGGACTAGC AACAAATGAA	14520
	GATTTGAAAT CaGctGCAAA AGCAGCTATT GATACACATG GTGTAGGTGC AGGCGCTGTT	14580
	CGTACAATCA ATGGTACATT AGATTTACAC GACGAATTAG AAGAAACACT AGCAAAATTT	14640
45	AAAGGAACAG AAGCTGCAAT AGCTTATCAA TCAGGATTTA ATTGTAATAT GGCTGCTATT	14700
	TCAGCTGTCA TGAATAAAAA TGATGCTATT TTATCAGATG AGCTTAATCA TGCATCAATT	14760
50	ATTGATGGAT GTCGCTTATC TAAAGCTAAA ATTATTCGAG TTAACCATTG AGACATGGAT	14820
	GATTTACGTG CGAAAGCAAA AGAAGCAGTT GAATCAGGTC AATACAATAA AGTGATGTAT	14880

55

ATTGCAGAAG AATTGGTTT ATTAACCTAT GTTGACGACG CTCATGGTTC AGGTGTTATG 15000
 GGTAAAGGCG CTGGTACGGT TAAACATTTT GGTTTACAAG ATAAAATCGA TTTCCAAATA 15060
 5 GGTACGCTTT CTAAAGCAAT TGGTGTCTGT GCGCGTTATG TAGCAGGTAC AAAAGAGTTA 15120
 ATAGATTGGT TAAAAGCACA ATCAGCACCA TTCTTATTCT CTACATCATT AGCACCTGGG 15180
 GATACCAAAG CAATAACTGA AGCAGTTAAA AAGTTAATGG ATTCAACTGA ATTACATGAT 15240
 10 AAATTATGGA ACAATGCACA ATATTTAAAA AATGGATTGT CAAAATTAGG ATATGATACA 15300
 GGTGAGTCAG AAACCTCAAT TACACCAGTA ATTATTGGTG ATGAAAAAAC AACTCAAGAA 15360
 TTTAGTAAGC GTTTAAAAGA CGAAGGTGTC TATGTGAAAT CTATCGTTTT CCCAACAGTA 15420
 15 CCAAGAGGTA CAGGACGTGT AAGAAATATG CCTACAGCTG CACATACAAA AGACATGTTA 15480
 GATGAAGCAA TTGCGGCTTA TGAAAAAGTA GGAAAAAGAA TGAAGTTGAT TTAATATTTA 15540
 20 TTTATTCCCA CGGCAAATAT TGTCGTGGGC TTTTTTAAT GTTTAGTTTA TTAACAGT 15598

(2) INFORMATION FOR SEQ ID NO: 83:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 661 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 83:

AAGTAAATCA ACTTACTGGG ATAAGAATAA AGGCGATTAT AGTAACAAGT TGATTTTATT 60
 CGAAAAACAT TTTGAACCGG TTCTGGGTAT CAAGATGCAA CATAGTGGAG GTCATAGCTT 120
 35 TGGCCACACG ATTATTACGA TTGAAAGTCA AGGAGATAAA GCAGTTCATA TGGGTGATAT 180
 ATTCCCAACT ACTGCACATA AAAATCCTCT ATGGGTAACG GCATATGATG ATTATCCTAT 240
 GCAATCGATT CGTGAAAAAG AACGCATGAT ACCATATTTT ATTCAGCAAC AATATTGGTT 300
 40 CTTGTTTTAT CATGATGAAA ACTACTTTGC TGAAAATAC AGCGATAATG GTGAAACAT 360
 AGATGCATAT ATTTTACGTG AAACATTAGT TGATAATAAC TAAAATAAAG ATGTATTACT 420
 AAACAAATTT TCAAAAATAA AAAATTGAGC CACATCCAAT CTTACTAATT AGGGTGTGGC 480
 TCATTTTTAA GTTTTACgAT CCAATCAAA TATGGaTAA ATTCgTATTA ACGCTCTACa 540
 ATGtTAATGA CTTCAACAGT ATATGCATCT GCATAAAAAT CATAATGAAT ATTTTGACCA 600
 50 TTTTAAATAG TTGTAATTCC ACCTTGATAA ACTAAACGGT ATTTATCAGT TTCAGGATGA 660
 A 661

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 5738 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 84:

10	GCAGACGGTA CAGCAGTTAA AGTCGCACCA AaACTGTAGT GAATcTAATC GGTGcATTCT	60
	TTTTAGGATT AGTTGTGCGG CTTATATATA TCTTCTTCAA AGTAATTTTC GATAAGCGAA	120
15	TTAAAGATGA AGAAGATGTA GAGAAAGAAT TAGGATTGCC TGTATTGGGT TCAATTCAAA	180
	AATTTAATTA AGGATGGTTG CTACTTATGT CAAAAAAGGA AAATACGACA ACAACACTAT	240
	TTGTATATGA AAAACCAAAA TCAACAATTA GTGAAAAGTT TCGAGGTATA CGTTCAAACA	300
20	TCATGTTTTTC AAAAGCAAAT GGTGAAGTAA AGCGCTTATT GGTTACTTCT GAAAAGCCTG	360
	GTGCAGGTAA AAGTACAGTT GTATCGAATG TAGCGATTAC TTATGCACAA GCAGGCTATA	420
	AGACATTAGT TATTGATGGC GATATGCGTA AgcCAACACA AACTATATT TTTAATGAGC	480
25	AAAATAATAA TGGACTATCA AGCTTAATCA TTGGTCGAAC GACTATGTCA GAAGCAATTA	540
	CGTCGACAGA AATTGAAAAT TTAGATTTGC TAACAGCTGG CCCTGTACCT CCAATCCAT	600
	CTGAGTTAAT TGGGTCTGAA AGGTTCAAAG AATTAGTTGA TCTGTTTAAT AAACGTTACG	660
30	ACATTATTAT TGTCGATACA CCGCCAGTTA ATACTGTGAC TGATGCACAA CTATATGCGC	720
	GTGCTATTAA AGATAGTCTG TTAGTAATTG ATAGTGAAAA AAATGATAA AATGAAGTTA	780
	AAAAAGCAAA AGCACTTATG GAAAAAGCAG GCAGTAACAT TCTAGGTGTC ATTTTGAACA	840
35	AGACAAAGGT CGATAAATCT TCTAGTTATT ATCACTATTA TGGAGATGAA TAAGTATGAT	900
	TGATATTTCAT AACCATATAT TGCCTAATAT CGATGACGGT CCGACAAATG AAACAGAGAT	960
40	GATGGATCTT TTAAAACAAG CGACAACACA AGGTGTTACA GAAATCATTG TAACATCACA	1020
	TCACTTACAT CCTCGATATA CCACACCTAT AGAAAAAGTG AAATCATGTT TAAACCATAT	1080
	TGAAAGCTTA GAGGAAGTAC AAGCACTAAA TCTAAAGTTT TATTATGGTC AGGAAATAAG	1140
45	AATTACCGAT CAAATCCTTA ATGATATTGA TCGAAAAGTT ATTAACGGTA TTAATGATTC	1200
	ACGCTATTTA CTAATAGAAT TTCCATCAAA TGAAGTTCCA CACTATACTG ATCAATTATC	1260
	TTTCGAATtA CAGAGTAAAG GCTTTGTACC GATTATTGCA CATCCAGAGC GGAATAAAGC	1320
50	AATAAGTCAA AACCTTGACA TACTATACGA TTTAATTAAC AAAGGTGCTT TAAGTCAAGT	1380
	GACAACGGcG TCATTAGCGG GTATTTCCGG TAAAAAATT AGAAAATTAG CAATTCAAAT	1440

55

EP 0 786 519 A2

GTTCTTAATG AAAGACTTAT TTAATGATAA GAAATTACGT GATTATTATG AAGATATGAA 1560
 CGGATTTTATT AGTAATGCGA AGTTAGTTGT TGATGATAAA AAAATTCCTA AACGAATGCC 1620
 5 ACAACAAGAT TATAAACAGA AAAGATGGTT TGGGTTATAA ACAGCAAATG AGGGGTTTTA 1680
 TGGCACATTT ATCTGTGAAA TTGCGGCTTT TAATACTAGC ATTAATCGAT TCACTGATAG 1740
 TGACATTTTC AGTATTCGTA AGTTATTACA TTTTAGAACC GTATTTCAAA ACATATTCTG 1800
 10 TCAAATTATT AATATTGGCA GCTATATCAC TATTCATATC GCATCATATT TCaGCATTTA 1860
 TTTTAAATAT GTATCATCGA GCGTGGGAAT ATGCCAGTGT GAGTGAATTG ATTTTAATTG 1920
 TTAAAGCTGT GACGACATCT ATCGTTATTA CGATGGTGGT CGTGACAATT GTTACAGGCA 1980
 15 ATAGACCGTT TTTTAGATTG TATTTAATTA CTTGGATGAT GCACTTGATT TTAATAGGTG 2040
 GCTCAAGGTT ATTTTGGCGT ATTTATCGGA AATACCTGG AGGTAAGTCA TTTAATAAGA 2100
 20 AGCCAACTTT AGTTGTTGGT GCTGGTCAAG CAGGTTCAAT GCTGATTAGA CAAATGTTGA 2160
 AAAGTGACGA AATGAACTT GAACCGGTAT TAGCAGTCGA TGATGACGAA CATAAACGCA 2220
 ATATCACAAT TACTGAGGGT GTAAAAGTCC AAGGTAAAT TGCGGATATT CCAGAACTAG 2280
 25 TGAGGAAATA TAAGATTAAG AAAATCATCA TTGCAATTCC AACTATTGGT CAAGAGCGTT 2340
 TGAAAGAAAT TAATAATATT TGCCATATGG ATGGCGTTGA GTTATTGAAA ATGCCAAATA 2400
 TAGAAGACGT CATGTCTGGT GAGTTAGAAG TGAACCAACT TAAAAAAGTT GAAGTAGAAG 2460
 30 ATTTACTAGG CAGAGATCCT GTTGAATTAG ATATGGATAT GATATCAAAT GAATTGACGA 2520
 ATAAACTAT TTTAGTTACG GGTGCAGGTG GTTCAATAGG ATCAGAAAT TGTAGACAAG 2580
 TTTGTAATTT CTATCCAGAA CGTATTATTC TACTTGGCCA TGGTGAAAAC AGTATTTATT 2640
 35 TAATCAATCG TGAATTGCGA AATCGCTTCG GwAAAAATGT TGATATCGTT CCTATTATAG 2700
 CGGATGTGCA AAATAGAGCG CGTATGTTTG AAATTATGGA AACGTATAAA CCATACGCAG 2760
 TTTATCATGC AGCAGCACAC AAGCACGTGC CGTTAATGGA AGACAACCCT GAAGAAGCAG 2820
 40 TACGTAATAA TATTTTAGGT ACGAAAAATA CTGCTGAAGC TGCTAAAAAT GCAGAGGTAA 2880
 AGAAATTCGT TATGATTTCT ACGGATAAAG CCGTTAATCC GCCTAATGTC ATGGGAGCTT 2940
 45 CAAAGCGAAT TGCAGAAATG ATTATTCAA GTTTAAATGA TGAAACGCAT CGAACAAAT 3000
 TTGTTGCAGT GAGATTTGGT AATGTACTTG GATCGAGAGG ATCTGTGATT CCACTTTTCA 3060
 AAAGTCAAAT TGAAGAAGGT GGGCCAGTTA CTGTGACACA TCCTGAAATG ACACGTTACT 3120
 50 TTATGACAAT TCCTGAAGCT TCTAGACTAG TTTTGCAGGC AGGGGCATTA GCAGAAGGTG 3180
 GCGAAGTATT TGTGCTAGAT ATGGGAGAAC CAGTGAAAT TGTAGATTTG GCACGTAATT 3240

55

	CCGGCGAAAA AATGTTTGAA GAGCTTATGA ATAAAGATGA GGTTCATCCT GAACAAGTAT	3360
	TTGAAAAAAT TTATCGTGGC AAAGTACAAC ATATGAAATG TAATGAAGTT GAAGCGATTA	3420
5	TTCAAGACAT CGTCAATGAC TTTAGTAAAG AAAAAATTAT TAACTATGCC AATGGCAAAA	3480
	AGGGAGATAA TTATGTTTGA TGACAAAATT TTATTAATTA CTGGGGGCAC AGGATCATTC	3540
	GGTAATGCTG TTATGAAACA GTTTTATAGAT TCTAATATTA AAGAAATTCG TATTTTTC	3600
10	CGCGATGAGA AAAACAAGA TGACATTCGA AAAAAATATA ATAATTCAAA ATTAAAGTTC	3660
	TACATTGGTG ATGTGCGTGA TAGTCAAAGT GTAGAAACAG CAATGCGAGA TGTGATTAC	3720
	GTATTCCATG CAGCAGCTTT AAAACAAGTG CCGTCATGTG AATTCCTTCC AGTTGAGGCA	3780
15	GTGAAGACAA ATATTATTGG TACAGAAAAT GTCTTACAAA GTGCTATTCA TCAAATGTT	3840
	AAAAAAGTCA TATGTTTATC TACAGATAAG GCAGCGTATC CTATTAATGC TAGGGGTATT	3900
20	TCAAAGCAA TGATGAAAA AGTATTCGTA GCCAAATCAA GAAATATTCG TAGTGAACAA	3960
	ACGCTTATTT GTGGTACAAG ATACGGTAAT GTGATGGCTT CAAGAGGATC AGTAATACCT	4020
	TTGTTTATCG ACAAATCAA AGCTGGAGAA CCTTTAACGA TTACAGATCC TGATATGACA	4080
25	AGATTTTAA TGAGCTTAGA AGATGCGGTA GAACTAGTTG TTCATGCATT TAAGCATGCA	4140
	GAGACAGGAG ATATTATGGT TCAAAAAGCA CCAAGCTCAA CGGTAGGGGA TCTTGCAGCC	4200
	GCATTATTAG AATTGTTTGA AGCTGATAAT GCAATTGAAA TCATTGGTAC GCGACATGGA	4260
30	GAGAAAAAAG CAGAAACATT GTTGACGAGA GAAGAATACG CACAATGTGA AGATATGGGT	4320
	GATTATTTA GAGTGCCGGC AGACTCCAGA GATTTAAATT ATAGTAATTA TGTGAAACC	4380
	GGTAACGAAA AGATTACGCA ATCTTATGAA TATAACTCCG ATAATACACA TATTTTAACG	4440
35	GTGGAAGAGA TAAAGAAAA ACTTTTAACA CTAGAATATG TTAGAAACGA ATTGAATGAT	4500
	TATAAAGCTT CAATGAGATA GGAGAGATTG ACGTTGAATA TTGTAATTAC AGGAGCAAAA	4560
	GGTTTGTAG GAAAAAATT GAAAGCAGAT TTAACCTCAA CGACAGATCA TCATATTTTC	4620
40	GAAGTACATC GACAACTAA AGAGGAAGAA TTAGAGTCAG CATTGTTGAA AGCAGACTTT	4680
	GTCGTGCATT TAGCGGGTGT TAATCGACCT GAACATGACA AAGAATTCAG CTTAGGAAAC	4740
45	GTGAGTTATT TAGATCATGT ACTTGATATA TTAAGTAGAA ATACGAAAAA GCCAGCGATA	4800
	TTATTATCGT CTTCAATACA AGCAACACAA GATAATCCTT ATGGTGAGAG TAAGTTGCAA	4860
	GGGGAACAGC TATTAAGAGA GTATGCCGAA GAGTATGGCA ATACGGTTTA TATTTATCGC	4920
50	TGGCCAAATT TATTCGGCAA GTGGTGTAAG CCGAATTATA ACTCAGTGAT AGCAACATTT	4980
	TGTTACAAAA TTGCACGTAA CGAAGAGATT CAAGTTAATG ATCGGAATGT TGAACCTAACG	5040

55

ATTGAAAATG GTGTACCTAC AGTACCAAAC GTATTTAAAG TGACATTGGG AGAAATTGTA 5160
 GATTTATTAT ACAAGTTCAA ACAGTCACGT CTCGATCGAA CATTGCCGAA ATTAGATAAC 5220
 5 TTGTTTGAAA AAGATTGTGA TAGTACGTAT TTAAGCTATC TACCTAGTAC aGACTTTAGT 5280
 TAYCCCTTAC TTATGAATGT GGATGATAGG GGTTCCTTTA CAGAATTTAT AAAAACACCG 5340
 GATCGTGGTC AAGTTTCTGT AAATATTTCT AAACCAGGTA TTAATAAGG TAATCACTGG 5400
 10 CATCATACTA AAAACGAAAA ATTTCTAGTC GTATCAGGTA AAGGGGTAAT TCGTTTTAGA 5460
 CATGTTAATG ATGATGAAAT CATTGAATAT TATGTTTCTG GCGACAAATT AGAAGTTGTA 5520
 GACATACCAG TAGGATACAC ACATAATATT GAAAATTTAG GCGACACAGA TATGGTAACT 5580
 15 ATTATGTGGG TGAATGAAAT GTTGATCCA AATCAGCCAG ATACGTATTT CTGGAGGTA 5640
 TAGCGCATGG aAAACTGAA rTTAATGACA ATAGTTGGTA CAAGGCCTGA AATCATTCGT 5700
 20 TTATCATCAA CGATTAAAGC ATGTGATCAA TATtTTAA 5738

(2) INFORMATION FOR SEQ ID NO: 85:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9062 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 85:

ATCATCAACA AGAATGATAT TTTCCCATC TACTATATCT TTTACCGCAG ATAACTTCAC 60
 TCTCACACCT TGCTCACGTA ATTCTTGAGT TGGTTGAATA AATGTTCTTG CAACATATTG 120
 35 ATTTTAACT AGTCCCATTT CATATGGCAA ACCTATTTCT TCAGCATAAC CACTCGCAGC 180
 TGATAGCGAT gAATTGGGTA CACCGATGAC CATATCAGCA TTTACAGGGC TTTCTTGGGC 240
 40 TAATTTTTTA CCAGAAGCTT TACGTACTGC ATGGACATTT TTACCAGCTA TTGTTGAGTC 300
 TGGTCTAGCA AAATAAATAT ATTCCATCGC AGAAATTGCA GTTGTCGTAT GATGTGTATA 360
 AGATTAACT GTAATACCTT TATCGTTAAT CACGACATAT TCACCTGCAT GAATATCTTG 420
 45 AACAAATTCT GCACCTAACA CATCTATTGC ACATGTTTCA CTTGCAAGGA TGTATGTCCC 480
 ATCTTTCATT TTACCTACAA CAAGTGGTCT GATAGCATTG GGATCTACTG CGCCATATAA 540
 CGCATCTTTA GTTAAATCG CAAATGTAAC ACCGCCTTTA ACTTTTCGCA AACTTCTTTT 600
 50 CAACGCTTCC TCAAAAGTAG GAGCTTTACT TCGACGTATC AAATGCATAA TGACTTCAGT 660
 ATCAGAAGAC GAATGGAAGA TAGCACCTTG TTTTCTAAA TTCTGACGCA ATGATTTAGC 720

55

EP 0 786 519 A2

	CGGTGAATA TTTTCAATAC CTTTATTACC TGAAGTAGCA TAACGGACGT GACCAATTGC	840
	ATGTTGATAT CCTTTTAATC GTTCCATTGG ATCATCTTTA ATCGCTTCAG TTAGTAAGCC	900
5	TAATCCTCGC TCGCCTTTTA ATTCATTTTG ATCAGAAACA ACTATACCTG CACCTTCTTG	960
	ACCACGATGT TGCAAACTAT GAAGTCCCAT ATAtGTTAGT TCGCTGCTT CaGGATGATT	1020
	CCAAATACCA AACACGCCAC ATTCTTCGTT TAATCCTGAG TAGTTAAACA TTGaGCAATT	1080
10	GCCCCtTCCC ATATTTGTTT AATATCTGAA ACATTTTCAC TAATCTCTGT aTATGGTGTT	1140
	GTTACCTTGr aATTATCACT ATCTGTTAAA AGTCCAATTT CTATTGCATT ATCAATATTT	1200
15	AAAGTTTTAC CTGATTTAAC AGAAACAACA TATCGGCCTT GCGTCTCACT AAACAATTGT	1260
	GCATTTGTTA TATCTATTGA AGATTTTAAT CCTAAACCGT AATGCGCACT TAGTTTAGCT	1320
	AAGGTAATCA GTAAGCCACC TTTACCAACT GTTTGAACAT GTGATAATAG TCCTTCACGA	1380
20	ATAGCGGTCT TGATTGATTC ACCTTTTTCA ACTTCTGAAC TCAAATCTAA TGA CTCAAAT	1440
	TCATGATTAA CTTTGCCATA AATTAAC TTTT TCAAGTTGAC TACCACCAA GTCGTCCTTA	1500
	GTATCACC GA TTAATATAA TTTATCTCCA ACTTGAGGTT CAAAATCATT TAAATAATTT	1560
25	ACATTTTCAA TCAAACCTAC CATTCCAACA ACTGGTGTG GGAAAATAGA AGTACCTTTC	1620
	GTTTCGTTAT ATAAAGATAC ATTACCAGAA ACTACTGGTG TCTTAAGAAT GTCGCATGCT	1680
	TCTGCCATAC CTTTCGTTGA ATCTATCAAC TGTGATAGA TTTCTTTCTT TTCAGGAGAA	1740
30	CCATAATTTA AACAATCTGT CATTGCTAAT GGTGTTGCAC CCACGGCAAT TAAATTT CGA	1800
	TAAGCTTCAG CTA CTACCAT CTTCCACCT TCATATGGAT TGTTATATAC ATAACGCGCT	1860
	TCACCATCAA TTGTTGAAGC AATTGCCTTA TTTGTGCCTT CCACACGTAC TACCGATGCT	1920
35	TGAAGTCCTG GCTTAATTAT CGTATTGGCA CCAACTTGTT GGTGCTATTG ATCATATAAA	1980
	TAGTGTTTAG ATGCTATAGT CGGATGCTTA AGTAATTTAA AGAAAGTATC TTTAACATCG	2040
40	ATGTGTGTAT AATCATTTTT AGAAGTATTA TAATCTTTTT CTTCTCCTTC TAAAATATAT	2100
	ACAGGTGCTT CATCAGCTAG TGGTTCAACT GGAATGTCAG CATAAACTTC GTCATCATAT	2160
	GTTAAACAA AACGATTTGT ATCTGTA ACT TCACCTATAA CAGCACTATC CAATTCGTGC	2220
45	TTATCAAATA AATCTAAGAA TTTTGTTC GTACCTTTTT CAACA ACTAG TAACATACGT	2280
	TCTTGAGTTT CTGAAAGCAT CATTTCATAA GGAGAAATAC CTGGCTCAGG TGTTGGCACT	2340
	TGTTCTAATC TCAAATGTAA CCCACTACCA CCTTTTGCCG CCATTCAGA CGATGAAGAT	2400
50	GTAAACCAG CAGCACC CAT ATCTGAATA CCAACTAATT CATCAAATGT AATTGCTTCA	2460
	AGTGTGCTT CCATTAATTT TTTACCTACA AATGGATCAC CGATTGTAC AGAAGGTCGT	2520
55		

EP 0 786 519 A2

	CGACCAGTTT TCAAACCAAC ATAAATGACC GAATTACCTA CACCTTTTGC TGTGCCTTTT	2640
	TGAATCATGT CGTGATTGAT AACACCAACA CACATTGCAT TAACAAGTGG ATTGCCATCA	2700
5	TAACGTTTCAT CAAATTCGAT TTCACCAGCA GTTGTGGaA TACCAATGCA GTTACCATAA	2760
	CCTCCGATAC CCTTTACAAC ACCTTTAAGT AATCTTTGGT TTTGTTTATT ATCTAATTCT	2820
	CCAAATCTAA GACTGTTTAA CAAATTAATA GGTCTAGCCC CAATAGAGAC AATGTCACGA	2880
10	ATGATTCCAC CAACGCCTGT AGCAGCCCCT TGATATGGTT CAATTGCTGA TGGATGATTG	2940
	TGAGACTCTA CTTTAAATAC TACGGCTTGA TTATCACCTA TATCGACTAC CCCTGCACCT	3000
	TCACCAGGCC CCATAAGCAC ATGGTcACCT GACGTAGGAA ATTGCTTTAA AAACGGTTTA	3060
15	GAATGTTTAT AAGAGCAATG TTCACTCCAC ATAACAGAAA AGATACCTGT TTCTGTAAAG	3120
	TTAGGTTGTC TGCCTAAAAT ATCGCAAAC TTTTCATATT CTTGATCaCT TAATCCCAT	3180
20	TCTTGATATA CTTTTTCAAG TTTAATTTCT TCAACGCTTG GTTCGATAAA TTTAGACATG	3240
	TTGTTCCCTC CAACTTTTTA CCATCGCTTC AAATAATTTT ACACCACTAT CAGTACCTAA	3300
	CAACGTTTCT AAAGCTCTTT CagGATGtGG CATCATGCCA CATACTTGC CTTTTTCGTT	3360
25	AACAATTCCT GCAATATCAT CATATGAACC GTTCGGATTA TTCACATATT TCAGAATAAT	3420
	TTGATTGTIA GCTTTTAATT GTTGATATAT TTCATCAGTA CAATAATAAT GACCTTCACC	3480
	GTGAGCTACA GGATATATAA CTTTTTCACC TTGTTTATAA AGATTTGTAA ATGCCGTTTG	3540
30	ATTATTCACT ATTTCTAACT CTTCATTTCT ACTAATAAAT AAATGTGAAT CGTTATGCAA	3600
	TAATGCACCA GGTAATAAGC CTATTTCACT TAAAATTTGA AACCCTTAC AAACACCTAA	3660
	TACTGGCTTA CCTTCAGCTG CAAGACGTTT AACTTCCGAA ATAATCGGgG CTACACTAGC	3720
35	CATTGCCCCA GATCTTAAGT AATCCCCGAA TGAAAATCCA CCAGGAATAA GTACGCCATC	3780
	AAATēCACTT AGTGATGTTT CTCTATAATC TACATATTCC GCTTCAACAC CACTTTTAAT	3840
	AGCAGCATTA AACATGTCTC TATCACAATT CGAACCTGGA AAAACAAGAA CCGCAAATTT	3900
40	CATTTTATGC ATTCTCCTTT TCATCATCTA ACACTTTATA GCTATATTCT TCAATCACTG	3960
	TATTTGCAAA CAATTTTCA CTAGAGTTG TAATAATGTT GTGTACCTTT TCATCACTAA	4020
45	CCTCATCCAC TGTATATAT AATACTTTTCT CTACACGAAT ATCATTCCT TGTGCATAAC	4080
	CTAAGTCATG TACAGCTCGA GTAAGCGTTT GTCCTTGCGT ATCTAATACT TGTGGTTGTA	4140
	ATGTGATATG TAGTTCAATT GTTTTCATTA TTTTAAATCC TCCAATTTGT TTAAAAATAT	4200
50	TTGATATGTT TCAATCAGTG ATCCAGTGTT ATTTCTATAT ACATCTTTAT CAAAGTTTGC	4260
	ATTGGTAGCT TTATCCCAA TTCGACATGT ATCTGGAGAT ATTTCATCCG CTAACAAAAT	4320

55

EP 0 786 519 A2

	ATCCATTAAT TGTTCACA CATTATTAAT CTTTAATGCT TTGGATTTTA GTATTTCAAT	4440
	ATCTTCATCT GATGCTATAT TGAGCAATTT AACATGGTCA TCCGTTATCA ACGGATCATT	4500
5	TAACGCATCA TTTTATAGA AAAATTCTAC AAGTGGTTCT CTA AAAACTT CACCATTTTC	4560
	AAAACCTAAA CGCTTTGTAA TAGATCCACT AGCAATATTA CGAACAACTA CTTCTAATGG	4620
	AATTATTTTC ACAGGCTTAA CTAATTGTTC TGTTCAGAT AATTGTTTAA TAAAGTGACT	4680
10	TTCTATTCCA TTTCTTGTA AATATTTAAA TATAATAGAA GTAATTTGAT TATTTAATCG	4740
	CCCCTTACCT GCCATTGTGT CTTTCTTAGC CCCGTTTCCA GCAGTAACTT CATCTTTATA	4800
	TTCAACTCTT AATTCATTTT CTTGATTGTG TGAGAAAATG CGCTTCGCTT TTCCTTCATA	4860
15	TAATAATGTC ATGCTTTAAT TACTCCCCTC AAATTTAGCG TACATATCTT GTTCAGTTTG	4920
	GTTTACATCA TCGTTAGTA CAGTCATATG CCCCATTTTT CTGCTATCTT TACGCTCAGA	4980
20	CTTACCATAA ATATGTAAGT GCCACTCTGG ATGTTCATT AATTCATTTT CCAATAAATC	5040
	TAAATCTTTA CCTAGTAAGT TCATCATGAC TGCTGGCTTT AATAATTCAA TTGAATTTGG	5100
	TAATGATTGT CCGGTAACGT CTAAAATATG AGTATCAAAT TGTGAATAAT CACATGCTTC	5160
25	AATTGAATAA TGTCCGGAAT TGTGAGGCCT TGGTGCTATC TCGTTCACAT ACAATTGGTT	5220
	GTTACTATCT ATAAAAAATT CAACTGTAAA TGTTC CAATG AATGAATCG ATTGGATAAT	5280
	TTTATTA ACT TGCTCTTCG CCTCAGCTGT TTTATCTATT CTCGCTGGAA CAATTGTTTT	5340
30	GAAAAGTATT TGATTTCTAT GCTCATTTTC TTGTAATGGG AAAAAAGTGA TTTGATTGTT	5400
	GTTTCCTCTT GTAACAGTAA GAGATACTTC TTTCTTGATA TTCAAATATT TTTCAGCTAC	5460
	GCATTCACTA GTTTCAATTA ATTTAAAACC TTCTTGTAAG TCTTTTTCGT TGTTAATTAA	5520
35	AACTTGACCT TTGCCATCGT AGCCACCAAA TCTAGTTTTT ACAATAAAAAG GATATCCTAA	5580
	TGTTTCAATT GCTTTGTCAA TATCTGTAGA TTCTTTTACT GAAATGAACG GGACAACTTT	5640
	GGTACCAGCA CTTTTTAATG TTTCTTTTTC AGTTAAGCGA TCTTGTAATA ACTGTATAGC	5700
40	TTGGTAACCT TGC GGAATAT TGTACTTTTC ACATAATAGT TTTAATTGTT GGGCTGAAAT	5760
	GTTTTCAAAT TCATAAGTAA TCACATCACA TTTTGTCTT AATTGATTGA GTGCCTTTTC	5820
45	ATCGTCATAC TTGGCTTGTA TAAATTCGTG TGCAACGTAT CTACATGGAC AATCTTCAGA	5880
	AGGATCCAAT ACAACCACTT TATAACCCAT TTTTGTAGCT GATTGTGCCA TCATCTTTCC	5940
	AAGCTGACCA CCACCAATAA TGCCAATAGT CGCACCAAAC TTTAATTTAT TGAAGTTCAT	6000
50	TTTGCATGTC CTCCACTTTT TGAATTAACG AAGATTCATA CTGATTTAGT TTTTCAACTA	6060
	AAGAAGGATT TTGAATACTT AACATTCTTG CTGCAAGTAT ACCTGCGTTT TTAGCACCTG	6120

55

	AAGAATCTAT ACCCTTTAAA CTTTTTGTTT CAATCGGCAC TCCAATAACT GGTAGCGTCG	6240
	TTAATGATGC AACCATACCT GGTAAATGTG CCGCACCGCC AGCGCCTGCA ATGATAATGT	6300
5	TTATACCTCT TTCTCTCGCT TCAGAAGCAA ATTGAACCAT CATTTTGGC GTACGATGTG	6360
	CGGATACTAC TTGTTTTTCG TACGGAATTT CAAAATAATC CAACATGTTA CAACTCTCTT	6420
	GCATAATTTT CCAATCGGAA GAACTGCCCA TAATGACTGC TACTTTCCTT TTGTACACCC	6480
10	TTTCAAAGT TTGAATTGTG AATTACTTTA GTTGATATATT ATAGATATAG CATAACAAGC	6540
	AATTTCTGCT TTTTCAATCA AAAATCGAAC TTTATTTTGA TTTTATTATT GAATTTACGT	6600
15	CTTTTGCTAT GTAAATTAGT TTTATAAACT AACAAAGTTA GGATATTGAC AATAGGAGGA	6660
	GAAGTTTTTA TGTTGCTAA AATTTTAGAT GGTAAACAAA TGCCAAAGA CTACAGACAG	6720
	GGGTTACAAG ATCAAGTTGA AGCGCTAAAA GAAAAGGGTT TTACACCTAA ATTATCCGTT	6780
20	ATATTAGTTG GTAATGATGG CGCTAGTCAA AGTTATGTGA GATCAAAAAA GAAAGCAGCT	6840
	GAAAAAATTG GTATGATTTT AGAAATCGTA CATTTGGAAG AAACAGCTAC TGAAGAAGAA	6900
	GTATTAAACG AACTAAATAG ACTAAATAAT GATGATTCTG TAAGTGGTAT TTTGGTACAA	6960
25	GTACCATTAC CAAAACAAGT TAGCGAACAG AAAATATTAG AAGCAATCAA TCCTGAAAAA	7020
	GATGTGGACG GTTTTCATCC AATAAATATA GGGAAATTAT ATATCGATGA ACAAACTTTT	7080
	GTACCTTGCA CACCGCTCGG CATCATGGAA ATATTAAAAC ATGCTGATAT TGATTTAGAA	7140
30	GGTAAAAATG CAGTTGTAAT TGGACGAAGT CATATTGTCG GACAACCAGT TTCTAAGTTA	7200
	CTACTTCAA AAAATGCATC AGTAACAATC TTACATTCTC GTTCAAAGA TATGGCATCA	7260
	TATTTAAAG ATGCTGATGT CATTGTCAGT GCAGTTGGTA AGCCTGGTTT AGTAACAAAA	7320
35	GATGTGGTCA AAGAAGGAGC AGTAATTATC GATGTTGGCA ATACGCCAGA TGAAAATGGC	7380
	AAATTAAAG GTGACGTTGA TTATGATGCG GTTAAAGAAA TTGCTGGAGC TATTACACCA	7440
	GTTCTGGTG GCGTTGGTCC ATTAACAATT ACTATGGTAT TAAATAATAC TTTGCTTGCA	7500
40	GAAAAAATGC GTCGAGGTAT TGATTCGTAA AGAGCCTGAG ACATAAATCA ATGTTCTATG	7560
	CTCTACAAAG TTATAATGGC AGTAGTTGAC TGAACGAAAA TTCGCTTGTA ACAAGCTTTT	7620
45	TTCAATTCTA GTCAACCTTG CCGGGGTGGG ACGACGAAAT AAATTTTACG AAAATATCAT	7680
	TTCTGTCCCA CTCCCTAATA ACTGAGTTTT AATGAAGTCT TTTAACCAC ATTAAATATT	7740
	ATTTTGCAAT TGCAATGAAT AACAAGAAAA ATCTGGGACA TTAATCGATC AAATGCTCCC	7800
50	TTCAAAGTAG ACATTGAATA AATGAAGGCT TTGAAGGGAG CATTTCACTT TGTACTTGGC	7860
	TCAACAATTT TATATAGACA GTAGTTAATT GAATGAAAAT AAGCTTGTA CAAGTTTTCA	7920

55

EP 0 786 519 A2

	GTGGGGATG GGCCCCAACA CAGAAGCTGT GACTATGATA AAGTACTACT ACATAGTTAA	8040
	TCATTAGTGG TTCTTTATCA TTTTCGCCTC CCTTTTCTTA TTGTTTTGAT ACACAAAAAT	8100
5	TTAAGTTCAA ACTGTCGAAT AAAGTTATAT TTGATTTCAA ATTATCCCTA AATTATTAAT	8160
	TkTACAATTG TGGCAGATTT TCAAAATAAT AATTATTTCC TCATTATTTA TAAATTTATA	8220
	TTTAAATTTT ATTCTTTATA GGGTAAGATT AGGACTATAG TATGATGTGT AATAATATA	8280
10	AATTAAGGTA TAGTAAAGCT AACTCAGAAA TGACTTATCA TTCGGAGGTT ACATTATGAA	8340
	TAACTATTA CAGTCATTAT CAGCCCTCGG TGTTCCTGCT AACTAGTAA CACCAATTT	8400
15	AAATGCAGAT GCAACGACGA ATACTACACC ACAAATTAAA GGCCTAATG ATATCGTTAT	8460
	TAAGAAAGGT CAAGATTATA ACCTTCTAAA CGGCATAAGT GCATTTGATA AAGAAGATGG	8520
	AGATTTAACC GATAAAATTA AAGTCGATGG CCAAATTGAT ACATCTAAAT CTGGTAAATA	8580
20	TCAAATTAAA TATCATGTCA CTGATTCAGA TGGTGCAATT AAAATTTCCA CTAGGTATAT	8640
	TGAGGTTAAA TAGCCCTCAT CACTATACTG CAAATAAAAT GGTAGCAAAC GAACATGTTT	8700
	TGCTACCATT TTATTGTGA TTCTAACTTC ATCTGCAACT TTAACCCAAA TATTGTATT	8760
25	TTTCTGTATA CCAAAGGACT ACCTATCAAA TTATTAAAC TTAAGTCTC TTTTAAAAA	8820
	AATGTTTTGA TTTGAACAA ACAAATTTCC ACTTTTCATT GTTTAACGAT AAATTACTTT	8880
	TGGCAAATTC CTTATTAATA TGTTCGCT TCCTTTCAAT CAACTAGCCA TCATTTTCAA	8940
30	TTTATTAGAC AATTCAAAC TTTTTTTATT TTCATTCAAT TAACCTTTAA TTGAAAGCTA	9000
	TTCTCACTT TCCTTTTAAA TATGAAGCAA TTTTTCAAA AACGCTATTA GTCACAAAAT	9060
35	GT	9062

(2) INFORMATION FOR SEQ ID NO: 86:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 2738 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 86:

AAATATTTTT TCAAACTAT GTGAAAATGG aCCATGTCTa aATCATGTAA TAATGCAGyA	60
CATAATGCCA ACGGTCTmTC TTTATTGTCC CATGCATCAT GACCAATAAA TGACTCATCA	120
ATTAATCGTC TAACTATTTT ATACACACCT AAAGAATGTC CAAAGCGACT ATGTTCTGCT	180
GTGTGAAAAG ATAGGTACAG TGTTCTAGT TGTCTAATTC GACGTAACCT TTGGAATTCC	240

	TCTTTAAAAA CTTTTCTTC TACTAATTTT AAATCTACAT ATGCGTTAGT CATTATTCCC	360
	CTCCTTTTCG TTTAATATAA TATTTAATTT ACTTAAAATG CTTTGTACAT AAGTGCTAAG	420
5	TCTAACTTTT CGCCATACAT TTCTGGCTCA TAAGAGCGTA AGATTGTAAA ACCTTGCTCT	480
	TTATAGTAAG CTACTGCTTC TTCATTTTTA TTATCTACTT CTAAGTAAAC ACCTTCAAAT	540
	TTATCTTCAA AACGTGATAA TCCTTCATTT AACAATGCTG TACCATAACC TGTATGTTGC	600
10	GATTCTGGTT TAACATAATG AGCTGATAAA TATAATTCTT CACCGTAAAT AAAGTTAGCA	660
	AAGCCAACGA TGTCATTACC TTCTTCAACG ACTAAGAATA ATTGTTCTTG AAGTCTTTTC	720
	TTTAAATGAT GTTCATTATA TGAAGCTCT AACAAGTGAT TAACTGTTGT CGCAGCGTAT	780
15	ATATTTAAGT ATGTATTAAA CCAAGCTTTA GTTGCACAT CTCTAATTTG AACACATCT	840
	TTTTCAGTTG CTTGTCTTAC CTTGAACATG ACTTTCTCCC CTTATTAACA AGTTTTAATA	900
	ACGGCATTAT ACCACAACCT GCTCAATACT TAATAAACAA TGATTGTCTA TTCAATTTAT	960
20	ATATCTATAT TTTCCGTAA AATTAAAAAT AAAAAATAAC GAAGCAAAAA ATCACTTCGT	1020
	TTAGTATGAG GTATGTCTTA TTGCAATATA CTATTCCACT CAGTTGCACG TGCTAAGGCA	1080
25	TAGTTGTCTT TCATGATGTC ACCAGGCTTT TCAGCAGTTC CAATAATATA ACCATTTAAA	1140
	GTGGCACCTA TAAAGTCTAA ACTATATTTT ATTTGCGTAA TTGCTGGTTC GCTTTTATTT	1200
	TTGGACAATC TCCACCAACT AAAATAACTC TAAAATCCTT TTCGGCCATT TGTGCCTTAA	1260
30	AATTAGGATA TCGTTTATCT TGTAATGTTT CTGACCAATG TTCGATAAAT GCTTTCAATG	1320
	GTGCTGAAAT GCTATACCAA TACACTGGTG ATGCAAAAAT AATTGTATCA CTAGCCAATA	1380
	TTTTATCTAG AATCGGCAAA TAGTCATCGT CATATGAAGT AATAGTCTCT GCTGTATGTC	1440
35	TCACGTCACG TATCGGTTTA AACTGATGTT GTGTCACGTC AATCCATTGA TACTCTAAAT	1500
	CTTGCAAAGC GAATTTTGTT AATTGTGCAG TATTACCGTT TGGTCTACTC CCACCAAACA	1560
	AAACAGTAAT CATTTTAGCC TAACCTCACT TTTGATTAAAT AAATATCTGT GTTTTTCGTT	1620
40	ACCTAATTAT ACTATCATAA GCTTTGCCTA CCGAATAGTA AAACGCTTAC AACTTTTATA	1680
	TAAATTTGAC GAAATTTTCT CATGCCTTAT ATAACGTCGT TTGTGATACG GGGCTAATTC	1740
	ATGATGAAAT TAGATACATA TATCACCATT AAATACAATT CATTTAGTCT TCAATCGGAA	1800
45	ACAGTTCATC GATATATTGA ATCTCATCAT CTGATAAAAC GATATCTGCA GCTTTAATAT	1860
	TTTCAACGAC TTGTTCTGCA CGTTTTCAC CAGGAATAAT CACATCGATA GCTGGTCTCG	1920
50	TTAAATAAAA TGCTAATACA ATGTTTCGAA TTGAAGTTTG ATGTGCTGCA GCTATGCTTT	1980
	CCAAAGCTTT TACGCGACGC ACATTTTCTT CAAATACACC TGGTTTAAAA TCACGACGTG	2040

55

GCTAATGGGA AATATGGAAT AAATGTGATT TGGTGATCAA CACAATATTG TAATACTGCC 2160
 TCATTTTCGC GATGCAATAA ATTATATTCT AACTGTACAA CATCAACGTA ACCATCTTTA 2220
 5 TTTGCTTCTT TAAGTTGATC TAATGTGAAA TTTGATACAC CAATTGCTTT AATCTTCCCT 2280
 TGTTCTTAA GCTCTTGTA TGCTGCAACT GCTTGATCTT TCGGAGTGTT GTTATCCGGA 2340
 AAATGAATAT AATATAAATC GATATAATCA GTTTGTAGAC GTTCAAACCT ATTCTCAACT 2400
 10 TGTTGTTTAA AATATTCCGG TTGATTGTTT TGATGTACTT CTGATTTTTC ATCAAATTCA 2460
 TGAGACCCCT TCGTAGCAAT TTTAATTTGC TCTCGCGGAT ATTCTTTAAC AACTTCTCCA 2520
 ACCAATTCTT CTGATCGTTC TGGCCCATAA ATATATGCCG TATCTAATAA ATTAATACCA 2580
 15 TGATTAATGG CTGACGAAC AACATCTTTT CCTGTGTTCTT CATCTAAGTT CGGATATAAA 2640
 TTATGCCCAa CCTAtGCGTT CGTCCCAAGT GCGATTGGAA ACACCTCAAC ATCAGATTTA 2700
 20 CCTAAGTTTA CAAATTGCTn CATTAGACCC AGCnCTT 2738

(2) INFORMATION FOR SEQ ID NO: 87:

(i) SEQUENCE CHARACTERISTICS:

- 25 (A) LENGTH: 9425 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 87:

30 GATTAGATGA TATTTAACGA AAATTAAgT GmAAACTtG AATGTArGaa GTCTGATGTC 60
 GAAAATAGCT ATTAAAATAG AGTAGACGTA ATGtAAATGA AAGCACCTAA AATAGAAAAA 120
 35 TTTCAAAAAT AGCGTAATTA TTATAATAAA TAGACTGCCA ATAAAATGCA ATTTTTCCT 180
 TATAACATTC TTCAAAAAAT AATAGCAAAA TTATGTAAAA AATATCTTGT CATGGCAAGA 240
 40 TTGGCTGTGC TATAATCTAT CTTGTGCTTA AGAACGGCTC CTTGGTCAAG CGGTAAAGAC 300
 ACCGCCCTTT CACGGCGGTA ACACGGGTTC GAGTCCCGTA GGAGTCACCA TTTTTCAGGT 360
 CTCGTAGTGT AGCGGTTAAC ACGCCTGCCT GTCACGCAGG AGATCGCGGG TTCGATTCCC 420
 45 GTCGAGACCG TACAAATGCC TATCCAAGAG GATAGGCATT TTTTTCGTT TAATATTATA 480
 TTAATAAAAG ATATATGGAC GAATGATAAT CATATTGATT TATCTGTTTC TCCATTTTCT 540
 TTAAAATGTA TGAACCTCAA GTAACCTAGT GGTGGATAT GAAAGATAAA CGTAGACAAT 600
 50 AAAATCTTTA TTAGACGTAC AAACATATGC TACTGTCAAC ATATTTCTTC GTTGTGATAT 660
 GCCACCAGTC CTCCATAACA TCAATTGTTA AAGTAACGAA TAACGAATAA TGATATTTAT 720

55

	GACCTCATCA TTGTGTTAAA TATCATTGTC ACAATCCGCC GTGAGAACT AATAAAAAAT	840
	AGTAATATAT AAGTTTATAT TGGAAAATAG AATTAATAGC TTATAAATGG TAAATTATAT	900
5	AATAGGTTAC TATACGTTAT AAGACGGAAA ATGCGCACAA TAACAAAAAT AGTAAGCGAC	960
	ATCCTGTGAT TTTTACACA AACATAAACG ATAAAGAACA AAAAATGATA AAATAATATT	1020
	AATGATTTAA GAAAAGAGGT TTATGCAAAT GGCTAGAAAA GTTGTGTAG TTGATGATGA	1080
10	AAAACCGATT GCTGATATTT TAGAATTTAA CTTAAAAAAA GAAGGATACG ATGTGTA CTG	1140
	TGCATACGAT GGTAATGATG CAGTCGACTT AATTTATGAA GAAGAACCAG ACATCGTATT	1200
	ACTAGATATC ATGTTACCTG GTCGTGATGG TATGGAAGTA TGTCGTGAAG TGCGCAAAAA	1260
15	ATACGAAATG CCAATAATAA TGCTTACTGC TAAAGATTCA GAAATTGATA AAGTGCTTGG	1320
	TTTAGAACTA GGTGCAGATG ACTATGTAAC GAAACCGTTT AGTACGCGTG AATTAATCGC	1380
	ACGTGTGAAA GCGAACTTAC GTCGTCATTA CTCACAACCA GCACAAGACA CTGGAAATGT	1440
20	AACGAATGAA ATCACAATTA AAGATATTGT GATTTATCCA GACGCATATT CTATTA AAAA	1500
	ACGTGGCGAA GATATTGAAT TAACACATCG TGAATTTGAA TTGTTCCATT ATTTATCAA	1560
25	ACATATGGGA CAAGTAATGA CACGTGAACA TTTATTACAA ACAGTATGGG GCTATGATTA	1620
	CTTTGGCGAT GTACGTACGG TCGATGTAAC GATTCGTCGT TTACGTGAAA AGATTGAAGA	1680
	TGATCCGTCA CATCCTGAAT ATATTGTGAC GCGTAGAGGC GTTGGATATT TCCTCCAACA	1740
30	ACATGAGTAG AGGTCGAAAC GAATGAAGTG GCTAAAACAA CTACAATCCC TTCATACTAA	1800
	ATTTGTAATT GTTTATGTAT TACTGATTAT CATTGGTATG CAAATTATCG GGTTATATTT	1860
	TACAAATAAC CTTGAAAAAG AGCTGCTTGA TAATTTTAAAG AAGAATATTA CGCAGTACGC	1920
35	GAAACAATTA GAAATTAGTA TTGAAAAAGT ATATGACGAA AAGGGCTCCG TAAATGCACA	1980
	AAAAGATATT CAAAATTTAT TAAGTGAGTA TGCCAACCGT CAAGAAATTG GAGAAATTCC	2040
	TTTTATAGAT AAAGACCAAA TTATTATTGC GACGACGAAG CAGTCTAACC GTAGTCTAAT	2100
40	CAATCAAAAA GCGAATGATA GTTCTGTCCA AAAAGCACTA TCACTAGGAC AATCAAACGA	2160
	TCATTTAATT TTAAGAGATT ATGGCGGTGG TAAGGACCGT GTCTGGGTAT ATAATATCCC	2220
45	AGTTAAAGTC GATAAAAAGG TAATTGGTAA TATTTATATC GAATCAAAAA TTAATGACGT	2280
	TTATAACCAA TTAAATAATA TAAATCAAAT ATTCATTGTT GGTACAGCTA TTTCATTATT	2340
	AATgCACAGT CATCCTAGGA TTCTTTATAG CGCGAACGAT TACCAAACCA ATCACCATA	2400
50	TGCGTAACCA GACGGTCGAA ATGTCCaGAG GTAACCTATAC GCAACGTGTG AAGATTTATG	2460
	GTAATGATGA AATTGGCGAA TTAGCTTTAG CATTTAATAA CTTGTCTAAA CGTGTACAAG	2520

55

	GTGATGGTAT TATTGCAACA GACCGCCGTG GACGTATTCG TATCGTCAAT GATATGGCAC	2640
	TCAAGATGCT TGGTATGGCG AAAGAAGACA TCATCGGATA TTACATGTTA AGTGTATTAA	2700
5	GTCTTGAAGA TGAATTTAAA CTGGAAGAAA TTCAAGAGAA TAATGATAGT TTCTTATTAG	2760
	ATTTAAATGA AGAAGAAGGT CTAATCGCAC GTGTAACTT TAGTACGATT GTGCAGGAAA	2820
	CAGGATTTGT AACTGGTTAT ATCGCTGTGT TACATGACGT AACTGAACAA CAACAAGTTG	2880
10	AACGTGAGCG TCGTGAATTT GTTGCCAATG TATCACATGA GTTACGTACA CCTTTAACTT	2940
	CTATGAATAG TTACATTGAA GCACTTGAAG AAGGTGCATG GAAAGATGAG GAACCTGCGC	3000
	CACAATTTTT ATCTGTTACC CGTGAAGAAA CAGAACGAAT GATTGCGACT GTCAATGACT	3060
15	TGCTACAGTT ATCTAAATG GATAATGAGT CTGATCAAAT CAACAAAGAA ATTATCGACT	3120
	TTAACATGTT CATTAATAAA ATTATTAATC GACATGAAAT GTCTGCGAAA GATACAACAT	3180
20	TTATTCGAGA TATTCCGAAA AAGACGATTT TCACAGAATT TGATCCTGAT AAAATGACGC	3240
	AAGTATTTGA TAATGTCATT ACAAATGCGA TGAAATATTC TAGAGGCGAT AAACGTGTGCG	3300
	AGTTCCACGT GAAACAAAAT CCACCTTTATA ATCGAATGAC GATTGCTATT AAAGATAATG	3360
25	GCATTGGTAT TCCTATCAAT AAAGTCGATA AGATATTGCA CCGATTCTAT CGTGTAGATA	3420
	AGGCACGTAC GCGTAAAATG GGTGGTACTG GATTAGGACT AGCCATTTCG AAAGAGATTG	3480
	TGGAAGCGCA CAATGGTCGT ATTTGGGCAA ACAGTGTAGA AGGTCAAGGT ACATCTATCT	3540
30	TTATCACACT TCCATGTGAA GTCATTGAAG ACGGTGATTG GGATGAATAA TAAGGAGCAT	3600
	ATTAAATCTG TCATTTTAGC ACTACTCGTC TTGATGAGTG TCGTATTGAC ATATATGGTA	3660
	TGGAACCTTT CTCCTGATAT TGCAAATGTC GACAATACAG ATAGTAAGAA GAGTGAAACG	3720
35	TAACCTTTAA CGACACCTAT GACAGCCAAA ATGGATACAA CTATTACGCC ATTTCAGATT	3780
	ATTCAATTCGA AAAATGATCA TCCAGAAGGA ACGATTGCGA CGGTATCTAA TGTGAATAAA	3840
	CTGACGAAAC CTTTGAAAAA TAAAGAAGTG AAGTCCGTGG AACATGTTG TCGTGATCAT	3900
40	AACTTGATGA TTCCTGATTT GAACAGTGAT TTTATATTAT TCGATTTTAC GTATGATTTA	3960
	CCGTTATCAA CATATCTTGG TCAAGTACTG AACATGAATG CGAAAGTACC AAATCATTTTC	4020
45	AATTTCAATC GTTTGGTCAT AGATCATGAT GCTGATGATA ATATCGTGCT TTATGCTATA	4080
	AGCAAAGATC GCCACGATTA CGTAAAATTA ACAACTACAA CGAAAAATGA TCATTTTTTA	4140
	GATGCATTAG CAGCAGTGAA AAAAGATATG CAACCATACA CAGATATCAT CACAAACAAA	4200
50	GATACAATTG ATCGTACGAC GCATGTTTTT GCACCAAGTA AACCTGAAAA GTTAAAAACA	4260
	TATCGCATGG TATTTAACAC GATTAGTGTT GAGAAAATGA ATGCTATACT ATTTGACGAT	4320

55

EP 0 786 519 A2

	GCAA	ACTATA	ACGATA	AAAAA	TGAAAA	ATAT	CATTATA	AAAA	ACCTGT	CCGA	AGATGA	AAGCG	4440
	AGTT	CCAGCA	AAATGGA	AGA	AACGATT	CCA	GGAACCT	TTTG	ATTTT	TATTAA	TGGTCAT	TGGT	4500
5	GGTTT	CTTAA	ACGAAG	ACTT	TAGATT	GTTTT	AGTACGA	ATA	ATCAGT	CAGG	CGAGTTA	ACA	4560
	TATCa	ACGTT	TCCT	TAATGG	TTATCCA	ACG	TTTAATA	AAAG	AAGGTT	CTAA	TCAAATT	CAA	4620
	GTCAC	TTGGG	GTGAAAA	AGG	CGTCTT	TGAC	TATCGT	CGTT	CGTTATT	ACG	CACCGAC	CGTT	4680
10	GTTTT	AAATA	GTGAGG	ATAA	TAAATC	GTTG	CCGAAAT	TAG	AGTCTG	TACG	TTCAAG	CTTA	4740
	GCGA	ACAATA	GTGATAT	TAA	TTTGAAAA		GTAACAA	ACA	TCGCTAT	CGG	TTACGAA	ATG	4800
	CAGG	ATAATT	CAGATCA	TAA	TCACATT	GAA	GTGCAG	ATTA	ACAGTGA	AACT	CGTACCG	CGT	4860
15	TGGT	ATGTAG	AATATG	ATGG	CGAATG	GTAT	GTTTATA	ACG	ATGGG	aGGCT	TGaATA	AAATG	4920
	AACTG	GaAAC	TGACAA	AGAC	ACTTTT	CAIT	TTCGTG	TTTA	TTCTTG	TCAA	CATCGT	GTTA	4980
20	GTATC	GATTT	ATGTTA	ATAA	AGTCAAT	CGC	TCACAC	ATTA	ATGAAG	TCGA	GAGTAAC	AAAT	5040
	GAAGT	TAATT	TTCAGCA	AGA	AGAAATT	AAA	GTACCG	ACTA	GTATATT	GAA	TAAATC	AGTT	5100
	AAAGG	TATAA	AATTAG	AGCA	AATTAC	AGGG	CGATCAA	AAG	ACTTTAG	TTC	TAAAGC	TAAA	5160
25	GGCG	ATTCCG	ATTTG	ACCAC	ATCAGAT	GGT	GGAAA	ATTAT	TGAATG	CGAA	CATTAGT	CAA	5220
	TCGGT	AAAGG	TCAGT	GACAA	TAACTT	AAAA	GATTTG	AAAG	ATTATG	TTAA	CAAGCG	CGTA	5280
	TTTAA	AGGTG	CTGAAT	ATCA	ATTAAG	CGAG	ATTAGT	TCAG	ATTCTG	TAAA	ATATGA	ACAA	5340
30	ACGTAT	GATG	ATTTT	CCGAT	TTTAA	ATAAC	AGTAA	AGCGA	TGTTAA	AACTT	TAATATA	GAA	5400
	GATAA	CAAAG	CGACT	AGTTA	TAAACA	ATCA	ATGATG	GATG	ACATTA	AAGCC	CACAGAT	TGGT	5460
	GCAG	ATAAGA	AGCAT	CAAGT	GATTGG	TGTG	AGAAA	AGCAA	TCGAGG	CATT	ATATTAT	AAT	5520
35	CGTTA	CTTGA	AAAA	AGGTGA	TGAAGT	CAIT	AATGCT	AGAC	TCGGT	TACTA	CTCAGT	CGTG	5580
	AATG	AAACGA	ATGTT	CAATT	GTTACA	ACCA	AAC	TGGGAAA	TTAAAG	TGAA	GCATG	ACGGT	5640
	AAGG	ATAAAA	CGAATA	CTTA	CTATGT	CGAA	GCGACA	AAATA	ATAACC	CTAA	AATTAT	TAAAT	5700
40	CATTA	ATATG	AATCGT	TAATA	AGCTAG	CATT	GCAAGC	TCAT	CATATG	TGAG	AAGCGG	TGCT	5760
	AGCTT	TTTTTG	CTGGT	ACGGT	TTATTAT	TGGC	TGATG	TTTTT	GCGTCT	CCTAA	CGTGCG	CATT	5820
45	TATT	CATATT	TTAAGT	AGAA	CCGCATT	TGTA	AAATTAG	TGT	AACTGT	TATT	TTAAAA	AACTT	5880
	TAGT	ATTTGT	CTAAT	CATTG	TTATA	ATAAT	TAAGAA	ATTC	ATTGC	ACGTG	ATTATC	AAAA	5940
	TTTAA	ATATA	AGAA	ACCGGT	CGATGA	ACTA	AAGTTA	CATA	ATAGG	AAAGG	TATACAA	AAC	6000
50	AGCTA	ATATA	CTGAT	AGTTT	CTGTAG	GGGAA	AATCGT	TATAT	TTGCA	CTGAT	GTATATT	TGCA	6060
	GTCAT	ATAGA	GAGATT	GACT	GTTTAA	AGAG	AAAGG	ATGAG	CCGCTT	GATA	CGCATG	AGTG	6120

55

EP 0 786 519 A2

	TAGTTGATGT TGGTTTGA CT GGAAAGAAAA TGGAAGAATT GTTTAGTCAA ATTGACCGTA	6240
	ATATTCAAGA TTTAAATGGT ATTTTAGTAA CCCATGAACA TATTGATCAT ATTAAAGGAT	6300
5	TAGGTGTTTT GGCGCGTAAA TATCAATTGC CAATTTATGC GAATGAAAAA ACTTGGCAGG	6360
	CAATTGAAAA GAAAGATAGT CGCATCCCTA TGGATCAGAA ATTCATTTTT AATCCTTATG	6420
	AAACAAAATC TATTGCAGGT TTCGATGTTG AATCGTTTAA CGTGTCACAT GATGCAATAG	6480
10	ATCCGCAATT TTATATTTTC CATAATAACT ATAAGAAGTT TACGATTTTA ACGGATACGG	6540
	GTTACGTGTC TGATCGTATG AAAGGTATGA TACGTGGCAG CGATGCGTTT ATTTTTGAGA	6600
15	GTAATCATGA CGTCGATATG TTGAGAATGT GTCGTTATCC ATGGAAGACG AAACAACGTA	6660
	TTTTAGGCGA TATGGGTCAT GTATCTAATG AGGATGCGGC TCATGCAATG ACAGACGTGA	6720
	TTACAGGTAA CACGAAACGT ATTTACCTAT CGCATTTATC ACAAGACAAT AACATGAAAG	6780
20	ATTTGGCGCG TATGAGTGTT GGCCAAGTAT TGAACGAACA CGATATTGAT ACGGAAAAAG	6840
	AAGTATTGCT ATGTGATACG GATAAAGCTA TTCCAACGCC AATATATACA ATATAAATGA	6900
	GAGTCATCCG ATAAAGTTCC GCATTGCTGT GAGACGACTT TATCGGGTGC TTTTTTATGT	6960
25	TGTTGGTGGG AAATGGCTGT TGTGAGTTG AATCGGCTTG ATTGAAATGT GTAAAATAAT	7020
	TCGATATTAA ATGTAATTTA TAAATAATTT ACATAAAATC AATCATTTTA ATATAAGGAT	7080
	TATGATAATA TATTGGTGTA TGACAGTTAA TGGAGGGAAC GAAATGAAAG CTTTATTACT	7140
30	TAAACAAGT GTATGGCTCG TTTTGCTTTT TAGTGTAATG GGATTATGGC AAGTCTCGAA	7200
	CGCGGCTGAG CAGCATACAC CAATGAAAGC ACATGCAGTA ACAACGATAG ACAAAGCAAC	7260
	AACAGATAAG CAACAAGTAC CGCCAACAAA GGAAGCGGCT CATCATTTCTG GCAAAGAAGC	7320
35	GGCAACCAAC GTATCAGCAT CAGCGCAGGG AACAGCTGAT GATACAAACA GCAAAGTAAC	7380
	ATCGAACGCA CCATCTAACA AACCATCTAC AGTAGTTTCA AAAAAAGTAA ACGAAACACG	7440
40	CGACGTAGAT ACACAACAAG CCTCAACACA AAAACCAACT CACACAGCAA CGTTCAAATT	7500
	ATCAAATGCT AAAACAGCAT CACTTTCACC ACGAATGTTT GCTGCTAATG CACCACAAAC	7560
	AACAACACAT AAAATATTAC ATACAAATGA TATCCATGGC CGACTAGCCG AAGAAAAAGG	7620
45	GCGTGTATC GGTATGGCTA AATTAAAAAC AGTAAAAGAA CAAGAAAAGC CTGATTTAAT	7680
	GTTAGACGCA GGAGACGCCT TCCAAGGTTT ACCACTTTCA AACCAGTCTA AAGGTGAAGA	7740
	AATGGCTAAA GCAATGAATG CAGTAGGTTA TGATGCTATG GCAGTCGGTA ACCATGAATT	7800
50	TGACTTTGGA TACGATCAGT TGAAAAAGTT AGAGGGTATG TTAGACTTCC CGATGCTAAG	7860
	TACTAACGTT TATAAAGATG GAAAACGCGC GTTTAAGCCT TCAACGATTG TAACAAAAAA	7920
55		

EP 0 786 519 A2

TGAAGGCATT AAAGGCGTTG AATTTAGAGA TCCATTACAA AGTGTGACAG CGGAAATGAT 8040
 GCGTATTTAT AAAGACGTAG ATACATTTGT TGTATATCA CATTTAGGAA TTGATCCTTC 8100
 5 AACACAAGAA ACATGGCGTG GTGATTACTT AGTGAAACAA TTAAGTCAAA ATCCACAATT 8160
 GAAGAAACGT ATTACAGTTA TTGATGGTCA TTCACATACA GTACTTCAAA ATGGTCAAAT 8220
 TTATAACAAT GATGCATTGG CACAAACAGG TACAGCACTT GCGAATATCG GTAAGATTAC 8280
 10 ATTTAATTAT CGCAATGGAG AGGTATCGAA TATTAAACCG TCATTGATTA ATGTTAAAGA 8340
 CGTTGAAAAT GTAACACCGA ACAAAGCATT AGCTGAACAA ATTAATCAAG CTGATCAAAC 8400
 ATTTAGAGCA CAAACTGCAG AGGTAATTAT TCCAAACAAT ACCATTGATT TCAAAGGAGA 8460
 15 AAGAGATGAC GTTAGAACGC GTGAAACAAA TTAGGAAAC GCGATTGCAG ATGCTATGGA 8520
 AGCGTATGGC GTTAAGAATT TCTCTAAAAA GACTGACTTT GCCGTGACAA ATGGTGGAGG 8580
 20 TATTCGTGCC TCTATCGCAA AAGGTAAGGT GACACGCTAT GATTTAATCT CAGTATTACC 8640
 ATTTGAAAAT ACGATTGCGC AAATTGATGT AAAAGGTTCA GACGTCTGGA CGGCTTTCGA 8700
 ACATAGTTTA GGCGCACCAA CAACACAAAA GGACGGTAAG ACAGTGTTAA CAGCGAATGG 8760
 25 CGGTTTACTA CATATCTCTG ATTCAATCCG TGTTTACTAT GATATAAATA AACCGTCTGG 8820
 CAAACGAATT AATGCTATTC AAATTTTAAA TAAAGAGACA GGTAAGTTTG AAAATATTGA 8880
 TTAAAAACGT GTATATCACG TAACGATGAA TGACTTCACA GCATCAGGTG GCGACGGATA 8940
 30 TAGTATGTTT GGTGGTCCTA GAGAAGAAGG TATTTTATTA GATCAAGTAC TAGCAAGTTA 9000
 TTAAAAACA GCTAACTTAG CTAAGTATGA TACGACAGAA CCACAACGTA TGTATTAGG 9060
 TAAACCAGCA GTAAGTGAAC AACCAGCTAA AGGACAACAA GGTAGCAAAG GTAGTAAGTC 9120
 35 TGGTAAAGAT ACACAACCAA TTGGTGACGA CAAAGTGATG GATCCAGCGA AAAAACCAGC 9180
 TCCAGGTAAA GTTGTATTGT TgtAGCGCAT AGAGGAACTG TTAGTAGCGG TACAGAAGGT 9240
 TCTGGTCGCA CAATAGAAGG AGCTACTGTA TCAAGCAAGA GTGGGAAACA ATTGGCTAGA 9300
 40 ATGTCAGTGC CTAAAGGTAG CGCGCATGAG AACAGTTAT TTCATAATCA ACAGTCATTG 9360
 ACGTAGCTAA GTAATGATAA ATAATCATAA ATAAAATTAC AGATATTGAC AAAAAATAGT 9420
 45 AAATA 9425

(2) INFORMATION FOR SEQ ID NO: 88:

(i) SEQUENCE CHARACTERISTICS:

- 50 (A) LENGTH: 3886 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

55

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 88:

	AGTTGTAATG TCACATTTCC AGAGTCTGAA ATTATCTTTA TCACGTTACA TTTACTAGGC	60
5	TCTAAAATGA CTGAACATAC AGCATCTTCA ATTACCTTTG AATACCATGA TTTATCGCAA	120
	AATATACATG AATTGATCAC TTGTGTTAGC CAAGAATTAG GCATTGATAT GTCAAAAGAC	180
	AACAAGTTAC ATACCAGTCT GATCACACAT ATCAAACCAG CTATACATCG TATTAAATAC	240
10	GATATGCTAC AACCTAATCC TTTGAGGCAA GAAGTTATGC GTCGCTATCC TCAAATCATT	300
	GAAGCCGTTA GCAAGCATAT TAGTCCAATT GAACAAGATG CTGCTATTCTG CTTCAACGAA	360
	GATGAATTAA CATACTTAC AATTCACCTC GCATCAAGTA TAGAGCGTGT TGCAACACAT	420
15	AAACAATCAA TGATTAAGGT TGTCTTACTA TGTGGTTCTG GTATAGGCAC GTCACAACCTT	480
	TTAAATCAA AACTAAATCA CCTGTATCCT GaGTTnCACa TTTGGGAtGc CTATTcCATT	540
	TaTcAATTGG aAGaAAGTCG ATTATTGCAA GATAACATTG ATTATGTCAT TTCAACAGTA	600
20	CCTGTGAAA TATCAGCTGT ACCAGTTATT CATGTCGATC CATTTATCAA TCAACAATCT	660
	CGTCAAAAAT TGAATCAAAT TATCAATGAC TCAAGAGAAC AACGAGTCAT GAAAATGGCA	720
25	ACTGATGGCA AGTCACTCGC AGATTTATTG CCTGAACATC GCATCATTAT AAATAAACAA	780
	CCATTATCAA TTGAATCCGC AATTGCAGTG GCTGTGCAAC CTTTAATCAA TGATGGCATT	840
	GTCTATTCAA ATTATACAGC TGCAATTTTA AAACAATTTG AACAATTCGG GTCATATATG	900
30	GTCATTAGTC CACATATTGC ACTTATTCAC GCTGGTACTG ATTATGTACA GAATGGTGTA	960
	GGTTTCGCAC TAACATATTT CACTGAAGGG ATTATCTTTG GTAGTAAAGC TAACGATCCC	1020
	GTTCACTTG TAATTACATT AGCAACGGAC CACCCCAATG CACATTTAAA GGCATTGGGA	1080
35	CAGTTAAGCG AATGCTTAAG CAACGACTTA TATCGACAAG ATTTCTTAGA TGGGAATATT	1140
	TTTAPAAATTA AACAACACAT TGCTTTAACT ATGACAAAGG AGGCTTAATA ACGTGTCAAT	1200
	AGACATTTTG TCAACAACAC GCATCATTGT AAAAGAACAA GTAAATGATT GGAAGTGAAGC	1260
40	TATAACTATA GCTTCTCAGC CATTACTACA AGAACAAT ATTGAACAAG GCTATGTTCA	1320
	AGCAATGATT GATAGCGTTA ATGAACCTTG ACCTTATATC GTTATCGCAC CTGAAATTGC	1380
45	AATTGCACAT GCAAGACCGA ACAATGACGT ACATCAAGTT GGTTTAAGTC TATTAAAGTT	1440
	GAATCAACAT GTGGCATT TT GTGATGAAGA TCACTACGCA TCTCTCATT TTGTATTGAG	1500
	TGCCATCGAC AATCATTAC ACTTATCTGT ATTACAAAAT TTAGCAACCG TACTGGGCGA	1560
50	TAACCAAACA GTCCAGCAAC TATTAAGTGC AACAAATGCA CAAGACATTA AAAACATTTT	1620
	AAAGGAGCAT GATTAATATG AAAATTTTAG TAGTATGTGG CCACGGTTTA GGAAGTAGTT	1680
55		

	AAGTTGAACA TAGTGACATT ATGACAGCAA GTCCAGAGAT GGCTGACTTG TTTATTTGTG	1800
	GTAGAGATTT AGCTGAAAAT GCCGAACGTC TAGGGGATGT CTTAGTTCTT GATAATATTT	1860
5	TAGATAAAGC TGAATTACAA CAAAAGCTCT CAGAAAAATT ACAACAACCTT AACATGATTT	1920
	AAAGGAGGTA CGACCTATGC AAGCAATCCT TAATTTTATA GTCGATATTT TAAGTCAACC	1980
	AGCCATTCTT GTTGCCTGA TTGCCCTTTAT AGGTTTAAATC GTTCAGAAAA AACCTGCCCC	2040
10	AACGATCACT TCAGGAACCA TTAAAACGAT ATTAGGCTTC TTAATTTTAA GTGCAGGTGC	2100
	TGATGTCGTC GTTCGATCTC TTGAACCATT CGGCAAAATA TTCCAACACG CATTTGGTGT	2160
	GCAAGGTATC GTACCTAACA ACGAAGCTAT CGTCTCACTA GCCTTAAAAG ATTTTGGAAC	2220
15	AACAGCTGCA CTCATCATGG TCTGTGGCAT GATTGTTAAT ATTTTAATTG CCCGCTTCAC	2280
	TAATTTAAAA TATATCTTTT TAACAGGTCA TCATACATTT TACATGGCTG CGTTTTTAGC	2340
20	AATCATTTTA ACAGTCAGTC ATATTAAAGG CTGGCTAACG ATTGTTATCG GCGCACTCGT	2400
	ATTAGGATTA ATCATGGCAG TATTACCTGC ATTACTCCA CCTACGATGC GAAAAATTAC	2460
	AGGGAATGAC CAAGTAGCTT TAGGTCATTT TGGCTCAATC AGTTACTTTG CCGCAGTGCT	2520
25	GTAGGTCAAT TATTCAAAGG TAAGTCTAAA TCAACGGAAG AGATTAAATT TCCAAAAGGC	2580
	TTAAGTTTCT TACGAGAAAG TACAATTAGT ATCTCGATTA CGATGGCATT ACTTTACTTC	2640
	ATCGCATGCT TATTTGCGGG CGTTAGTTAT GTACACGAAT CTATTAGTGA TGGTCAAAAC	2700
30	TTTATTGTCT TTTCATTAAT TCAAGGTGTG ACATTTGCTG CTGGTGTATT TATTATTTTA	2760
	ACGGGCGTTC GTTTAATCTT AGCTGAAATC GTCCCAGCAT TTAAAGGAAT TTCTGAAAAG	2820
	CTTGTAACCA ATTCTAAACC TGCATTAGAC TGCCCTATTG TGTTCCCTTA TGCACAAAAT	2880
35	GCAGTATTAA TTGGATTCTT TGTCAGCTTT ATTACAGGTG TCATCGGTAT GTTTATCTTA	2940
	TTCTTATTTG GTGGCGTCGT CATTTTACCT GGCGTAGTTG CACACTTCTT CTTAGGTGCA	3000
	ACGGCTGCTG TATTCGGTAA TGCAAGAGGC GGTATTAAAG GTGCTATTGc TGGCGCCGCT	3060
40	CTAAATGGTA TCCTAATCAC GTTTTACCA TTATTATTCT TGCCATTTTT AGGCGAATTA	3120
	GGTGGTGCTG CAACAACATT CTCAGATACA GACTTTTTTAG CTGTCGGTAT CGTGTTCGGT	3180
45	AACGCAGTAA AATATATGGG ATTATTTGGT GCGATTCTAT TTATTATTAT CGTAGGTGCG	3240
	ACAACAATTT TATTAAAAGG CCGTCAAAAA GAACAGCAAT AGTGTTAACG TAGAAATATA	3300
	AAACACCGTC ACATATTGAG TGAATGCCCC TTTtATCAAG AGGAAAGCCA CTTACTTATG	3360
50	GACGGTGTTT TGTATTATAT TAAATGATAC TTAGCCATAC TATCGACAGC TGCTAAAATT	3420
	GCTTCTTCTT GTGTCGCAAT CGGTCCCAA CCAAGTAATG TTTTTgCACG TTCGTTACTT	3480

55

CCTAGACTCA AAATAAAGTC TGGTAATTTT TTAGTAGAAA CTTTTTGAGC TATTTTCAGGT 3600
 CTCTTTTCTT TAATTAATTT TGCAATTTCC AACAAATTAA TTTGTCCATC AGCCGTCGCA 3660
 5 ATAAATCGCT TGCCATTAGC TTGTTTCATT GTCAATTGCCA AAATGTGCAG TTCAGCTACG 3720
 TCTCTCACAT CAACAACATT TAACGGAATT TGCAGTACAC GTTTCATTGA ACCATTCAAT 3780
 AAATTTTCTA ATAAATGAAA GCTTCCTGAA ACGTGTGCAT CTAATGATGG CCCAAAAATT 3840
 10 GCAACTGGAT TGATTGTGGC AAATTCTACT GTTGTATTTT CATTCT 3886

(2) INFORMATION FOR SEQ ID NO: 89:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4879 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 89:

GTCATCTATC AAAAATTTGG TATACAGACC GACAATTATT AATTAATAAT TTAATTTCCC 60
 25 AGGCAATACC AGTGATTAAA TATCCACAAA TACAACATAA AGAACAACCA TTAGAATCTA 120
 TTTCACAAC TATATTGTCT AAGATGACAT CTAATCAATA GTGTTTAAAT TTCTCAGTGG 180
 CTGTGAATGA GGTTTAAAAG TACTATAAAA CGTAACTTT GATACTTTAA AATACGCAA 240
 30 AAACGGTAAA CCCTAATTCA TATTATAGAG TTTACCGTTT TATTTTTTAA CTGTCATCAT 300
 AGTTATATTA ACATTATTGT TGGTAGTTTG GATCAGTAAC CATTGCTTGT CCAGTATAAT 360
 CAACCGTTAC AATTGAATAT TTTCCATTG CATTGGGTC TTTAAACTA AACACATACT 420
 35 TATAGTTGCC ATTATGTTCT TCAATAGAAT AATCATTATA CACTTTATTA TTACTACCAA 480
 ATTTATTTGC TTCATTATTA GCCGCATTTA AAGCTGTTTG GAAATTTGGC AATTGCTGTA 540
 AAGCTTGATT TTTATTTCCA TTAAACGGAT AAATTTGACG TGCAACCGGC GCGGCATTTT 600
 40 GACCATAATA TGGTGCAACG TAACTTGATT TTTGATTATT AITCGCTTGG TTATTACTTG 660
 ATTGATTATT ATTTGTTTGG TTTGGTCAT TGTTTGTGC ATTTGAATTA GATTGTTGCT 720
 45 GGTTATCGTT TGCATATTA TCTTTATTAT CTTTGTTTAC GTCTTTACTA TCATCTTTAT 780
 TATCTTTCTT ATCTTTAGAT GAATCATTG TTTTTTTATC TTGTTGTTCA GTTTTCGCTT 840
 TATCATCTTT TTCTTTATTA CCGTCTTTTT GTTGGTCACT ATCTTGACCA CATGCAGCTA 900
 50 AAAATAATGA TAATGCTAGT AACCTGTAA CTAATCTTT CATACATATC TCCTCCTATA 960
 ATTCGATATT CATTGAATAA TCTTGAAATA CATATCTACC ATGTGTATCT TTTCATGGCT 1020

EP 0 786 519 A2

	TAAGGTTCTT TTTATTATAC CCTAATTTTT GTTCATTATT ATTTAATTTT TGTGAATTTT	1140
	ATGtTTkCTA TAAATTTAAT TATTTTACTT TAACAATTCA TTACGCATTT AGCATTTCAA	1200
5	GGTATACACA ATATTTATTA CTATGATTTT ATTTTATCTG CTGCAAAAAC AATCATTATA	1260
	ACTCTTTTTT CATAATTAAA TCTGTATCCG TTACATCACC TGTGTTGAAA TGATGTTTAC	1320
	CAACCACTTT AAATCCATGA CGTTTATAAA ATGCTTGAGC ACGAGGATTA TGCTCCCAA	1380
10	CTCCTAGCCA AATTTTATGT TTATTATGTT CTTGAGCAAT TTTTTCGGCC AATTCTATCA	1440
	ATTGTGAACC TCTTCCGCCA CCTTGAAAGT CTTTCAAAAA ATATATGCGC TGCACTTCTA	1500
	AATAGGTCTC CCCCATTTCT TCAGTTTGAG CACTATTAAT ATTCATCTTT ATATAACCAA	1560
15	CATTGCGACC ATCTTCTTGa TAAAAATAAT GAAATGAATC TACATGGTTA ATCTCTTGTG	1620
	TAAATTTCTC TACAGTATAA TTGTCTTTAA AAAATTGATC AAAATCTTTG TCATCATAGT	1680
20	AAGAACCAAA CGTGTCATAA AATGTTCTAG TTGCTAATTC AACTAATTCA CTAGCATTTT	1740
	GTTCTGAAAT TTCTTTGATT ATCCCAGCCA TATAATCCT CCAATAAACA GTGATCGAAT	1800
	CAAAATATTA CTTATGTTAT TTTTCAGCCA AAACATTTA AAAATACATT AACACAAATC	1860
25	AATTACAAAT TGTATTGATT GTGTGTAACA TCAATAAATG ATACATTTAT TCCAGTAAAA	1920
	TGGCCGTATT TTCAAAAGAG AAAAAGAGAG GATGTATCGT TGTGATAGAA ACATTTAAAG	1980
	CGTTTGTAAT TGATAAAGAT GAGAGTGTA AAGTGACACC AACTTTCAA CAATTATCGC	2040
30	CTACTGATTT ACCTAAAGGA GATGTGCTGA TTAAAGTACA TTAATCTGGT ATAAATTATA	2100
	AAGATGCTTT AGCGACTCAA GATCATAATG CAGTCGTAAA ATCGTATCCT ATGATTCCAG	2160
	GAATAGATTT AGCTGGAACA ATTGTTGAAT CCGAAGCACC AGGCTTTGAa AAAGGAGAAC	2220
35	AAGTAATTGT AACGAGTTAT GACCTAGGTG TCAGCCATTA TGGCGGTTTT AGTGAATATG	2280
	CGCGTGTAAA ATCAGAATGG ATTATCAAGC TTCCTGATAC TTAAACATTA GAAGAATCAA	2340
40	TGATATATGG CACAGCTGGT TATACTGCCG GTTTAGCAAT TGAAAGACTT GAAAAAGTTG	2400
	GAATGAATAT TGAAGATGGT CCTGTACTCG TTCGCGGTGC TTCAGGTGGT GTCGGTACTT	2460
	TAGCAGTACT CATGCTTAAT GAACTTGGTT ATAAAGTTAT CGCAAGTACA GGTAAACAAG	2520
45	ATGTTAGCGA TCAATTACTT GAACTTGGTG CCAAAGAAGT TATCGATCGA CTTCTGTGTG	2580
	AAGATGATCA TAAAAAGCCA CTCGCATCAT CAACTTGGCA AGCTTGTGTA GACCCTGTTG	2640
	GTGGCGAAGG TATTAATTAT GTTACAAAGC GTTTAAATCA TAGTGGGTCA ATTACAGTTA	2700
50	TTGGTATGAC TGCCGTAAT ACTTATACTA ATTCTGTATT CCCTCACATT TTAAGAGGTG	2760
	TAAACATTTT AGGAATTGAC TCGGTATTTA CTGCTATGAA ATTAAGACAG CGCGTTTGGC	2820

55

	TTGATGAACT TCCAGAACAA CTTAACAAAG TAATTAAACA TGAAAATAAA GGGCGCATTG	2940
	TTATCGATTT CGGTGTAGAT AAATAGTATT CATGAAAAAG ACATCCCGTT ATGCGAGATG	3000
5	TCTTTTTTAA TTTAGTATTT GATATACATA CCGCCTGAAT CTGGTTCGGT AGGTATAAAT	3060
	CCAAATTTTG TATATAATTT ATCCGCTGGG TAGTCTGCAA TCAGAcTAAC GTATGTACTC	3120
	TCAACAGCCA CACCTTTAAT ATATTGCATA ATATGCTCCA TAATTAGACT GCCGTAACCT	3180
10	TGACCTTGGT AACTTTTCAA AACTGCAATA TCAACAAATT GAAAAACAGT TCCGCCATCG	3240
	CCAATCACTC TACCCATACC AATTAAACGA TCTTTATCAT ACAAGGTTAC TGTAATAAAG	3300
	GCATTAGGTA ATCCTTTTTC aGCTGTTTCGC GCGTCTTTGG ACTCATACCT GCGTTAATCC	3360
15	TTAATGCGCA ATAATCCTCG CAAGTCGGAA TATCATATGT CACTTTAACC ATTATTTACC	3420
	CCACTTTTCA TCACACAATA TATCAACCTA GTATAAATGT TTATTTACAA TAGTCTTATT	3480
20	CGCTTCTTTA AACACTTCAT GATGACTTGA AACATAACCC TCTGCATTCT CATCTGGTTG	3540
	GATATATGTT TTAGCAAGGT TCGCTGCATT TGCACCATCA CTAAATGCAC TTGCAATTAG	3600
	ATGTGATTTT GCATCATGAT AAACAATATC TCCACACGCA TAGATACCAG GTATACTAGT	3660
25	TGTCGTATTA CCAAATCCTT TAACACGACA ATCATCATGC ATATCTAGCT TTGAAGATGT	3720
	TtCACTCAAT AATGTATTAC AACGATCAAA CCCATGACTA ATAATGACAT CGTCAAATTT	3780
	AACTGTATGC CTATCGCCAC TTTCAACATG TTCCAAAACA ACTTCACTTA TATGCGTTTT	3840
30	ATCATCATTG CCGACCAAGT ATTTAATACG TGTTTTTGGG CATAGTTTCA CATTTAAATC	3900
	TGTCACCAAC GTTTTCATCG CTTCATGACC ACTTACATCT TCTTTTCGAT AAACAACGT	3960
	CACGCTTTTA GCAATCTTGG CAATATCATG CGCCCAATCT AATGCTGTAT TTCCTCCACC	4020
35	TGATATTAAT ACATCTTTAT CTTTGAAACG TCTGTAACCT TGTACAACAT AATGTAAATT	4080
	AGTTtATTGA TATCTCTCTA CACCTTTAAC ATCTAATTGT TTTGGATTAA TAATACCCGC	4140
	ACCAATTGCA ATGATAACTG CTTTCGATGT ATATATTTCT CCCGCTTCTG TTTCAACTTC	4200
40	GAAATGACGT TCTGCCTTTT TCCTAATATC TACCACACGT TCATTCAAAT GAACTTCCGG	4260
	TTTTAAATAT AATCCTTGCT TAATTGTATC TTTTAAATTT TCATGACAAG GTTTTGGCGC	4320
	AATGCCGCCA ATATCCCAA TAATTTTTTC AGGGTAAATT CTCATCTTAC CCCCTAATTC	4380
45	AGATTGAACA TCTATCAATC TTACAGACAT ATCTCGCAAT CCAGCATAAA AGCTTGATA	4440
	CAAACCAGAC GGACCGCCAC CAATGATTGT AACATCTTTC ATTATGTGCC TCCTATGACT	4500
50	CTCTATATTC ATTTCTTTCA TTAACGTGCT CAAATTGATA ATTATTATCA TTAAAGCCA	4560
	TTATACTATT AATATTTATA TTGTTAAAAT AAATCGCATA GTTAGCCATG AATTATCAAT	4620

55

GAAAGATGTG TATATTTTTT AGTTCTAGTT ATATTATTTT TTAAGAACT CATCACGTGG 4740
 TTCTTTAAGA ATTGCTTGTC TTAAGAGAA AAATAGCAAC AATAAACCTG CAAGCATACC 4800
 5 TGTGTGCCCA ATACCTGCAA AGCCTGCnAA TGCTTCTGGA GAGTATGATT TACCAGTGAC 4860
 TTGGAAGAAT CCTTTTGTC 4879

(2) INFORMATION FOR SEQ ID NO: 90:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1560 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 90:

20 ATAATGTCTT AGaTTGATTG GGAGTTTTTT TAATTTTTTT GAAATTAAAT TAATCTGTAs 60
 yTAATAAAAA ATTTGAATAA CTGACACAYT TTTTGTATCA TAGCTAyATA CTTTGTGAAT 120
 TAATTCACAT TATAATAAGA GTGAAGATAA GAGTATTATA AATnATCTTT AAATAAATAT 180
 25 ATGTGAAGTA AAAATTACAC GTTAGCATAT CGATTATGgT CATTTCkTTT AACATATTAA 240
 CTgGGGgACG TTAAGAGTTA ACGGktGATA TCyAACTAAA AACAAGGTCA CAGTAGTATG 300
 TTTTAATCTG GCGTCTATTA CAAATAAAAA TTACATCTAT AATTATTTCGT TTTCTTTTTT 360
 30 GAAAGTAATA GCCAATTAAT ATCATAcata CTGGAGTGAC TATAAGGAGG ACATTATTAT 420
 GAGAGCAGCA GTTGTAACGA AAGATCACAA AGTAAGTATT GAGGACAAAA AGTTAAGAGC 480
 TTTAAACCT GGTGAAGCGT TGGTACAAAC GGAATATtGT GCGGTTTGTC ATACCGATTT 540
 35 ACATGTTAAG AATGCTGATT TTGGTGATGT TACAGGCGTT ACTTTAGGTC ATGAAGGTAT 600
 TGGTAAAGTC ATCGAAGTTG CGGAAGATGT AGAATCATTA AAAATTGGAG ACCGTGTGTC 660
 TATCGCTTGG ATGTTCGAAA GCTGTGGAAG ATGTGAATAT TGTACAACAG GTCGTGAAAC 720
 40 ACTTTGCCGT AGTGTGAAAA ATGCTGGTTA TACAGTAGAT GGTGCAATGG CTGAACAAGT 780
 TATTGTtACT GCAGACTATG CTGTGAAAGT ACCTGAAAAA TTAGATCCAG CAGCAGCGTC 840
 TTCTATTACA TGCGCAGGTG TGACAACTTA TAAAGCTGTA AAAGTAAGTA ATGTAAAACC 900
 45 TGGACAATGG TTAGGTGTTT TTGGTATAGG TGGTTTAGGT AACCTAGCTT TACAATATGC 960
 TAAAAACGTT ATGGGGGCTA AAATTGTTGC CTTTCGACATC AATGATGATA AATTAGCATT 1020
 50 CGCGAAAGAA TTAGGTGCTG ATGCTATTAT TAATTCTAAA GATGTTGATC CAGTTGCAGA 1080
 AGTTATGAAA TTAAGTATA ACAAAGGATT AGATGCAACA GTGGTAACTT CAGTTGCTAA 1140

TTTACCTGTT GATAAAATGA ACTTAGATAT CCCAAGATtA GTGCTTGATG GTATTGAAGT 1260
 AGTAGGTTCA CTTGTTGGTA CAAGACAAGA CTTACGTGAA GCGTTTGAAT TTGCTGCTGA 1320
 5 AAATAAAGTA ACACCTAAAG TTCAATTAAG AAAATTAGAA GAAATCAATG ATATTTTGA 1380
 AGAAATGGAA AATGGTACTA TAACTGGTAG AATGGTTATT AAATTTTAAA AATATCAACT 1440
 GACTATATAG ATAAAGAAGG TAGTGCTCTG AACACTATCA TTATTAATCA AACCCCGAGG 1500
 10 TTTTCCTGAA AAGATAGTGG nAAATCCCCG TGTTTTTTGG GTTTGAGGnG GTTGThTGTA 1560

(2) INFORMATION FOR SEQ ID NO: 91:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 11014 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 91:

GTCCTGThGC TGCAATGAAT ACGCCTAAAA ATCCAGGGAT GTAATGGATA CTTTGTGGTA 60
 25 GTACTAATGA TAGAAATGAT AAAAATGAAA TCACAAAGGC TACGCTCGCA AAAGCTTGAC 120
 ATGTACGCTT ATCGCCATAA TCTAACCTTG TACGTATATG TAATAAATAC TGTAATCCGA 180
 TACTTAAATA CATAATTGCC ACGCATAAGA AGAATGGGAA GAATGTCTTT TCAAAGTCCG 240
 30 GATATAGGCT GTTAGATAGG AAGACCATGA TGAACATATT AAACATCATA AACGAGACGT 300
 CTTTGAATGT AACTTGACCA AATCGATTTG TAAAAAATGT TTGATGAGAC CACATTAACC 360
 ATAAGAACAA ACTCATGACG ATGTATTTGA AAAATAAATC AGCTGAAATG GAACCGTTTT 420
 35 GTGTTGTAA AATCACAATG GCAATTTTTT GAATGGCATA GACGAAAATT AAATCAAAGA 480
 ACAACTCATG GAATCCTGCA CGCTTTTCAG CTAAATGTTT TGGTGTTAAT GCATTAACCA 540
 TAAAAATTTA ACTCCTTTAA GATGTGTAAT TAATTTACTA AGTATACTAT TTATTTTTTC 600
 40 TAGTGAATAG GGCAGATTT GGCATGAAG TGAAGGAGA GGTGACTGCA AGGTAATTGC 660
 GGAATTAACA ATCATCAGCG ATTTAATATT TGAATGGAGA CGTCATGGTA ATAAAAAATT 720
 45 GATGAGAAAT TGATGGTGAA ACCAGCTGTG AATAsCGaTG CAATGATrSA TAGaATTTAA 780
 TTAGAGTCAT TACGCGaAAT GATTAATGAT AATTTGTGGT AAATCAAAGC aTAATTTTGT 840
 ACTATAGATG AGGATGATAG AGCATATTTA AGAGGGTGAA ATGTTAAAGT GAAACCGTTT 900
 50 ACGTTTCCGA TTGCCCAAAC AAATTACATC ATTGTATAAT ATGATTTGTT AAATGCATAA 960
 CAAGAATGAA AATGTAACAT ACGTAGCAAT TGGTTTCATA AATTGGATGT TAGTGGCGTA 1020

EP 0 786 519 A2

	TGACGAGAGT CGTATTAGCA GCAGCATACA GGACACCTAT TGGCGTTTTT GGAGGTGCGT	1140
	TTAAAGACGT GCCAGCCTAT GATTTAGGTG CGACTTTAAT AGAACATATT ATTAAAGAGA	1200
5	CGGGTTTGAA TCCAAGTGAG ATTGATGAAG TTATCATCGG TAACGTACTA CAAGCAGGAC	1260
	AAGGACAAAA TCCAGCACGA ATTGCTGCTA TGAAAGGTGG CTTGCCAGAm ACAGTACCTG	1320
10	CATTTACGGT GaATAAAGTA TGTGGTTCTG GGTAAAGTC GATTCAATTA GCATATCAAT	1380
	CTATTGTGAC TGGTGAAAAT GACATCGTGC TAGCTGGCGG TATGGAGAAT ATGTCTCAAT	1440
	CACCAATGCT TGTCAACAAC AGTCGCTTTG GTTTTAAAAT GGGACATCAA TCAATGGTTG	1500
15	ATAGCATGGT ATATGATGGT TTAACAGATG TATTTAATCA ATATCATATG GGTATTACTG	1560
	CTGAAAATTT AGTAGAGCAA TATGGTATTT CAAGAGAAGA ACAAGATACA TTTGCTGTAA	1620
	ACTCACAACA AAAAGCAGTA CGTGCACAGC AAAATGGTGA ATTTGATAGT GAAATAGTTC	1680
20	CAGTATCGAT TCCTCAACGT AAAGGTGAAC CAATCGTAGT CACTAAGGAT GAAGGTGTAC	1740
	GTGAAAATGT ATCAGTCGAA AAATTAAGTC GATTAAGACC AGCTTTCAA AAAGACGGTA	1800
	CAGTTACAGC AGGTAATGCA TCAGGAATCA ATGATGGTGC TGCGATGATG TTAGTCATGT	1860
25	CAGAAGACAA AGCTAAAGAA TTAAATATCG AACCATTGGC AGTGCTTGAT GGCTTTGGAA	1920
	GTCATGGTGT AGATCCTTCT ATTATGGGTA TTGCACCACT TGGCGCTGTA GAAAAGGCTT	1980
	TGAAACGTAG TAAAAAAGAA TTAAGCGATA TTGATGTATT TGAATTAAAT GAAGCATTTG	2040
30	CAGCACAATC ATTAGCTGTT GATCgTGAAT TAAAATTACC TCCTGAAAAG GTGAATGTTA	2100
	AAGGTGGCGC TATTGCATTA GGACATCCTA TTGGTGCATC TGGTGCTAGA GTATTAGTGA	2160
35	CATTATTGCA TCAACTGAAT GATGAAGTTG AAAGTGGTTT AACATCATTG TGTATTGGTG	2220
	GCGGTChAAC TATCGCTGCA GTTGATATCAA AGTATAAATA ATAAGAAAAC AGGTTATCAC	2280
	AACAgTATTA ATlACATGTT GGCATAACCT GTTTTTATTT GTTTATGGAT TTATTGGGTA	2340
40	ATATTAGTCA TTTGATGGTT TAATTGCAAA TGCTCTAACA GGGAACCCAG GTGCATCTTT	2400
	TGGTTTAGGG CTGATAGCGT AAATGATGGC GCCACGAGTT GGTAATTGAT CTAAATTAGT	2460
	TAATAACTCG ACTTGGTATT TATCCTGACC AAGAATATAA CGTTCGCCAA CTAAATCACC	2520
45	ATTTTTTACA ACGTCCACAG ATGCATCGGT ATCGAATGTT TCATGACCAA CAGCTTCAAC	2580
	ACGACGTTCT TCAATTAAGT ACTTCAAAGC ATCTAATCCC CAACCCGGTG CATGTTGTTG	2640
	TCCGTTGCA TCTTTGTTTT CAAACTTTTC AATATTAGGC CAACGTTTTG ACCAATCGGT	2700
50	ACGAAGTGCA ACAAAGTGC CAGGTTCAAT AGTACCATGC TCTTTTTCCC ATGCTTCTAT	2760
	ATGCGCACGT GTTACGATGA AATCATTGTT GTTCGCTACT TCTGTTGAAA AGTCTAATAC	2820

55

	AAAGTGAATT GGTGCATCAA TGTGAGTACC ATATTGCGTT ACAATATTCC AACGTTGCAC	2940
	ATAGAAACCA TGATCTTTAA CCGTGAATAA AGTTGAAACT TCGCCTTTTT CAAACTCACT	3000
5	AAAACGTGGT ATTTCCGGAT CAAATGTATG CGTTAAATCA ACCCAAGTTG CTTGTTTTAA	3060
	AGTATTTAAT TGTTGCCATA AAGGATATTG TGTCAATAAA TCACCCGTTT TTAGTTTATT	3120
	ATATGATAAA TGCTGCGATT ATTCTTGGCG TTTAGCTTTA ACAGCATTCA CAAGCACAGT	3180
10	CAATGCATCT TTAACCTCTT CTTCCTTTTCG CGTTTTTAAA CCACAGTCAG GGTTTACCCA	3240
	GAATAATGAG CGGTCGATTT GTTGTAGTGA ACGATTGATT GCTGTAGTAA TTTCTTCTTT	3300
15	TGTTGGAATA CGTGGACTAT GAATATCATA TACACCTAGA CCAATACCTA AATCATAATT	3360
	AATATCTTCA AAGTCTTTAA TTAAATCACC ATGGCTACGA GATGTTTCAA TTGAAATAAC	3420
	ATCAGCATCT AAGTCATGAA TAGCATGAAT GATTTGACCG AATTGAGAAT AACACATATG	3480
20	TGTATGGATT TGAGTTTCAT CACGAACTGA AGACGTTGCA AGTTTAAATG ATAAAACAGC	3540
	ATCTTTAAGA TATTGTTCTG GATATTCAGA GCGTAATGGT AAGCCTTCAC GTAATGCAGG	3600
	TTCGTCAACT TGGATAACTT TGATTCCTGC AGCTTCAAGT GCTAATACTT CTTCGTTGAT	3660
25	TGCTAAAGCA ATTTGATCTT GAACGACTTT ACGTGGTAAA TCAACACGTT CAAATGACCA	3720
	GTTTAGAATT GTTACAGGTC CAGTTAACAT ACCTTTAACT GGTATTATCTG TTAAGCTTTG	3780
	TGCATAAACT GTTTCATCAA CAGTTAAAGG CGCTGTCCAT TTTACATCAC CATAAATGAT	3840
30	TGGTGGTTTT ACGGCACGTG AACCATATGA TTGCACCCAA CCGAATTTAG TTAATAAGAA	3900
	ACCTTGTAAT TTTTCTCCGA AGAATTCAAC CATGTCATTA CGTTCAAATT CACCGTGAAC	3960
	TAATACATCT AAGCCAATGT CTTCCTGAAT TTTAATCCAT CGAGCAATTT CATTTTTTAA	4020
35	GAATGTTTCA TATGCTTCGT CTGTAATGCG TTTGTTCTTC CAATCTGCAC GGTATTTTCG	4080
	AACTTCTCGG CTCTGTGGGA ATGATCCAAT AGTTGTTGTT GGTAAATCCG GTAAGTTCAA	4140
40	ACGTTTTTGT TGTTGTTCAA TACGTTGCGC GAATGGTGAT TGTCTTGAAG TACGCACGCT	4200
	TTCGAAATCA TAATCTAAGT TTTGAATGA TTGATTTTGG AAACGCTCAT AACGTGCTTT	4260
	TAATTTATCA TATTTAACAC TATCGTTTTG ATTAAATAGG CGACGCAATG CATCTAATTC	4320
45	GTCTAATTTT TCAGTTGCAA AGCTTAAGCC TTCGCCAACA CTTGTATCTA ATGTTTCATC	4380
	ATCTAAAGAT ACTGGAACAT GTAATAATGA AGATGATGGT TGAATGACAA GTTCATTAGT	4440
	GTGTGCTAAC AATTATCGA TTAAGACTTT TTTAGCTTCA ATGTCACTTG CCCATACATT	4500
50	ACGACCATCA ATAATTCAG CGTATAATGT TTTTGATTTA TCAAAATCTC CAGCTTCAAT	4560
	TTGTTTAAGG TTATAGCCAT TATCATGGAC AAAGTCTAAA CCTATACCAC CAACAGGTAA	4620
55		

	AACACCAGCT	TTTTCGAAAT	AGTCATAAGC	TTCACGTGTA	ATATTTTCAT	AGCTTTCGCT	4740
	GTCGTCTGTA	ACTAAGATTG	GCTCATCAAC	TTGAATGTAC	TCAGCACCTG	CATCAATTAA	4800
5	TGATTCAAAC	ACTTCTTTAT	AAAGTGGTAA	TAACGTTTTA	ACTTTTTCTT	CAAAAGTTTG	4860
	GTGACCGCCT	TTTGATAATT	TAACAAAAGT	AATCGGACCA	ACAATGACAG	GGTGAGCGTT	4920
	AACGTTTAAA	GATTGGGCAT	ATTTAAAGCG	ATCTAATAAT	ACATTGCGAC	TCACTTTAGG	4980
10	CTCAACATTG	TCCCATTCAG	GTACGATGTA	ATGATAGTTA	GTGTTAAACC	ATTTTATAAG	5040
	TGCACTTGCA	ACATGGTCTT	TATTACCGCG	AGCAATATCA	AATAATAAAT	CATCATCAAT	5100
15	AGTTCTTCCT	TGGAACGTT	CAGGGATGAT	GTTGAATAAT	AATGACGTAT	CTAATATATG	5160
	GTCATATAAA	GAGAAATCAC	CAACTGGGAT	GCTATCTAAG	TGATAGTACT	TTTGtAATAA	5220
	TAAATTTyCT	TTATGTAGAT	CAGTTAATGT	TTGATCTAAT	TCTTCTTTAG	AAATCTTCTT	5280
20	TGCCCAATAA	CTTTCGATGG	CTTTTTTCCA	TTCTCTTTTT	CTACCTAATC	TTGGGAATCC	5340
	TAAGTTTGAT	GTTTTAATTG	TTGTCATAAT	ATTGCCTCCT	TGTGAGCAGT	AATAGATTTT	5400
	GAGTATGCTG	CAAGTTCTAA	TGAATCTTCG	ACATTTTGAA	ACGGTGTGAT	AATGTATAAA	5460
25	CCATTAAAAT	ATTCATGAAC	AGTATCGATT	AAATCCTTTG	AAAGCTTAAG	ACTTAGTTCT	5520
	CGTGTTTTGG	CTTTATCATC	TTTAACTGCT	TCAAATTGTT	GTAAAATTC	ATCTGACATC	5580
	TTGATTCCCTG	GCACTTCATT	ATGCAAAAAG	AGTGCGTTTT	TGTAACCTGC	GATAGGCATA	5640
30	ATGCCTATGA	AAAATGGTTT	GTTCAAGTGC	TTAGTGGCAT	GGTAAATTC	AATGATTTTC	5700
	TCTTTGCTGT	ACACGGGTTG	TGTTATAAAA	TAAGACATTC	CGCTTTCTAT	CTTTTTCTCT	5760
	AATCTTTTGA	CGGCACCATA	TAATTTACGA	ACATTAGGGT	TAAAGGCGCC	AgcGATGTTG	5820
35	AAGTGTGTAC	GTTTCTTCAG	CGCATCACCG	TCAGTGTTAA	TACCTTGATT	AAATCTTAGA	5880
	GCGAgTTCAG	TTAATCCTTT	AGAATTAACA	TCATAGACAT	TGGTTGCACC	TGGTAAGTGA	5940
	CCAACTTTTG	AAGGATCACC	AGTTATGGCT	AATATTTTCG	TAACGCCAAT	GAGCGATAAT	6000
40	CCAAGTAAAT	GGGACTGCAA	GCCGATTAAG	TTTCGGTCTC	GACATGTAAT	ATGTACGAGT	6060
	GGTTCAATAT	TGTAATATTG	CTTAATTAAG	CTAGCAGCAG	CAATATTGCT	AATTCTGACA	6120
45	GTTGCCAATG	AATTATCTGC	GAGTGTTACC	GCATCTACAT	TAGCTTTATC	AAGTTTAGCG	6180
	ATATTTTCAA	AAAATCTATC	CGTGTCTAAA	TGTTTCGGTG	TATCCAATTC	GATAATAACG	6240
	GTTGGACGTT	CTTGAACCTT	AGATGTTAAT	GATTGTCTAA	CTTTATTTTG	AGATGGATTG	6300
50	AAAAGTGCTT	TCGTTGGTAT	CGGAATCACT	TTTTTGTCAT	TAACAGGTTT	AAGTGCTCTGA	6360
	ATAGATTCCT	TAATAAATTT	GATGTGCTCT	GGCGTTGTAC	CACAGCAACC	ACCAATTAAA	6420
55							

	TACTTAAATT CACTATTTTC AATATCTAAT AAGCTGGCAT TTGGATAACA AGATAAGAAT	6540
	GCGTGCTCTG GTAATTCAAT ATGTGTGAAA GACTCTTGCA TATGGTGCGG GCCATGATGA	6600
5	CAATTGAGTC CCACGATGTT TGCACCACAT TGAACGAGTT GTTTTAATCC TTCATTGATT	6660
	GCCTGACCAT TAACTAAGTA ATTTGTGTTT GAAGCGGTTA ATTGAGCAAT GATTGGAATG	6720
	TCGTATTTCT TTCTCGTTCG TGAAATGACA TTTGTAACT CTTCTAGGTC GTAATACGTT	6780
10	TCGAAAAGTA GCGCGTCAAC GCCTTCTTCA ATTAAGGTGT CTATTTGAAT TTCAGTATGA	6840
	TAAAGAATAG TTTGTAAGCT GATATCCTCT TGTTTGATAC CTCTAAACCC ACCAACTGTG	6900
15	CCTAATATAT ACGTATCTTT ATTTGCTGCT TTTTTTGC GA TCGGAACGGC GGCTTGATGT	6960
	ATTGCTTTAA CTTTATCTTC AAGACCGAAT CGTTTAACT TTTCAAAAT TGCACCATAA	7020
	GTATTGTTTT GAATGACATC AGCACCGGCT TCAATATATG AACGATGGAT GCGTTCAACT	7080
20	TTATCTGGAT GGCTAAGATT ATATGCTTCT GGACAGGTGT CTAATCCTTC AGAGTATAAA	7140
	ATGGTTCCCTA TAGCGCCATC AGCTACTAAA ACATTATCTT TCAATTGTGT GAGGAATTGA	7200
	CTCATTGAAT GCCTCCTTTA ATGCGTATTT GATGTCTGCA ATGAGTTCAT CAGGATCTTC	7260
25	GAGACCAACA CTTAATCGGA ATAGACCGAA AGTGATACCA CGTTCTTGTC TCACTTCTTC	7320
	AGGTAGTGCA GCGTGAGACA TTGTTGCTGG ATGTGAAAGG ATCGTTTCAA CACCGCCCAG	7380
	ACTCACTGAA ACGAGTGGTA ATGTCAGTGC ATCGACAAAT TGTTGTGCTT TAGACTCATC	7440
30	AGCTAAACGA AAGCCAATAA CGGCACCGCC ATTTTGTAGCT TGTTCTAAAT GAGCAGTAGT	7500
	GAGTCCCGGA TAATAAATT CTGAAATTTT ATCTTGCTTT ATTAATAATG ACACGATTTT	7560
	TTGAGCGTTT TCGACAGATT GTTTAAATCT GATTGGAAAA GTTTTTAAAT GTTTAGCAAG	7620
35	TGTCCAGCTA TCCTGAGCAG ATAACATATT GCCTGTACCA TTTTGTATTA AATAAAGAGC	7680
	GTCACTAATT GCCTCATTAT TAGTTATGAC AGCACCAGCA ATTAATCGC TATGTCCACT	7740
	TAAAAATTTT GTAGCACTAT GAATGACAAT ATCAGCGCCA AGTAATAAAG GTGATTGACC	7800
40	TAACGGTGTC ATAAATGTAT TGTCCACAGC TACCAGTAGT TCATGCTTTT CGGCTATTTT	7860
	AGAAACAGCT TTGATATCAG TAATTTTAAA ACAGGGATTC GATGGTGTTT CGATATAAAT	7920
45	TAATTTTGTG TTTGATTGAA TGGCACCTC GATTTGTTCG AGCTTTGTAG TATCTACGGT	7980
	TGTAAATTCA ATATTAAATC GATTCAAAAT TTGCTCAGTG AGGCGAAAAG TACCGCCATA	8040
	TACATCATCG GGTAAGATGA CATGATCACC AGATTTGAAA GTCAAAAGTA CTGCTGAAAT	8100
50	AGCAGCAATA CCTGATGCAA AAGCAAAAGC GAATTTTCCC TGTTCTAATC GTGCTAACTT	8160
	CTCTTCTAAA AGTTCACGGT TAGGGTTGCC CTTCGTGCAT AATCATATTT AACATCGCCA	8220

55

EP 0 786 519 A2

	TCCACACCTC TACGCCAATC GAATATCACT TCTGTCTCTT TTGAAAGTGT CATACAATCT	8340
5	CTCCAATCTG AGCTTTATCT AATGCTTGGA TGATATCGCG TTCGATGTCT TCATAATTTT	8400
	CAACACCTAG TGATAAGCGG ATTAAATACT CATCAATGCC ACGTTTATCT TTTTCAGCAT	8460
	CTGGCATATC AACATGTGTT TGGGTGTAAG GGAAGGTCAC TAATGTTTCA GTACCTCCTA	8520
10	AACTTTCTGC AAAAATGCAA ATGTCTAAAT TTTCTAATAA TTTAGCGACG CTATAGGCCT	8580
	TGTTAAGTCT TAAACTAAGC ATGCCAGTTT GCCCGCTATA TAGTACTTCG TCAATTGCTT	8640
	GAAGTGACTG ACATTTTTTA GCAAGTTTTT TAGCGTTTGA TTGCGCACGC TCAATGCGTA	8700
15	AATGCAAAGT TTTAAGTCCA CGTAACAACA AATAACTATC TATTGGTGAA AGTGTGCGC	8760
	CAGTCATGTT GTGAAAATCA AACAACTGTT GCGCGAGTGA TTCATCTTTG ACGGTTACGA	8820
	CACCTGCTAG TACATCGTTA TGTCCGCCAA TATATTCGT GGCTGAATGT AAGACTATAT	8880
20	CAGCACCTTC TGCTAGTGGT GTTGAAAGAT AAGGTGTAA AAAAGTATTG TCGATAATTG	8940
	ACAATAAGCC TTTAGCTTTA CAAAGTTGAT AGTATGGCTT TACATCAATA GCAATCATT	9000
	GTGGGTAGA TATTGGTTCA ATGAATAATG CAACTGTTT ATCAGTGATT TCTTTTTCAA	9060
25	CTTGTTTATA ATCTGTAAAA TCAACGTACT TAAATTTGAT ATCGTATTGT TGCTCGTAAA	9120
	ATTCAAATA TCTAAATGTG CCACCATATA AATCGAATGA AACTAAAATT TCATCATGAG	9180
	GTTTAAATAG ATTACATATT AATTGAATGG CTGACATTCC ACTTGATGTA GCGAATGATG	9240
30	CAATACCATG CTCAAGTTTG GCAAAACAGG TTTCAAATGT TGAGCGTGTA GGATTTTTAG	9300
	TACGTGTATA ATCAAAACCT GTCGATTGTC CTAGTTTGG ATGCTTGTA GCGAGTAGATA	9360
35	AATGGATTGG ATTCGCTATA GCACCGGTTG AATCATCGGT TAATGTGATT TGGGCTAACT	9420
	GTGTATCCTT CATATTAAGA CCCTCCTATA AGAAAAATA AAAAAAGCTT CCGTCCTTCG	9480
	TACCCGAATG AATCGGATAA AAAGGACGAA AGCTTATGTT TCGCGGTACC ACCTTTATTT	9540
40	GTTATTCCAT CGCTGAAATA ACCTTATTCA GTACGCATTA AAAGTAAATA TGCTTACTGA	9600
	ACAATTATCA CAATTAAAGT CAGTAAGTAA GGATATAGTA ATGTGCTATC CCATACTTAT	9660
	TAACAAAAAA TCGTGCGTAA AGAATCCAGT ACGCCATTTA ACATCAATGT TAATACTGTA	9720
45	TCGCTATAAC GGGCGAACCC GTAGACACCT CATATTGGCA TCAACACTCC AAGGCCATTT	9780
	TCAAACACGC TTTCAAAATC TTCTCTCAGC TACTAAAGAC TCTCTGTATA AGCAGGGTGT	9840
	GTTTTACTT CCTCTTTATT GTGTTTACGT TTCATTAAAC TGTTATAAGA TATTAATTAG	9900
50	CTTACAGACT AAAAAAGAT TTGTCAACAA TTATTCAGAA AATTTTGATT TAAAAGTTAA	9960
	TTTGTTTGTG AAATGTGAAT TGGTATCTTG AAGTTGAAAA ATGAATTATT TTTTAAATAA	10020

55

TCAAATAAAA AGTGATGTGA GTGAATTGTC AAAAAGTGAA GATCAACGTA TTAATAAAC 10140
 AAAAGATGAA CAAATTAAGC AAATAGATAT ATCGGATATC AAACCGAATC CGTATCAGCC 10200
 5 CCGAAAAACT TTCGATGAAA ATCATTTAAA TGATTTGGCA GATTCAATTA AGCAATATGG 10260
 AATTTTGCAA CCAATTGTGC TTAGAAAAAC AGTTCAAGGT TATTACATTG TAGTTGGTGA 10320
 AAGAAGGTTT AGAGCTTCGA AAATGCTGG TCTAAAATAC GTATCAGCGA TTATCAAAGA 10380
 10 TTAAACAGAT GAAGATATGA TGGAACTGGC GGTATCGAA AATTTACAAC GAGAAGACTT 10440
 AAATGCGATT GAAGAAGCTG AAAGTTATCA ACGTTTGATG ACAGATTGTA AAATTACACA 10500
 ACAAGAAGTA GCGAAACGAT TGAGTAAGTC GCGCCCGTAT ATAGCGAATA TGTTGAGGTT 10560
 15 ATTACATTTG CCGAAAAAGA TTGCTGACAT GGTAAAAGAT GGGCGACTGA CAAGTGCACA 10620
 TGGACGAACG TTATTGGCAA TTAAGATGA ACAACAAATG CTTAGGTTAG CGAAACGGGT 10680
 20 TGTTAAAGAA AAGTGGAGTG TCAGATATTT AGAAAACCAT GTTAATGAAT TAAAAAATGT 10740
 TTCGTCAAAG TCGGAAACAG ACAAAGTAGA TATACTAAG CCTAAATTTA TAAAGCAGCA 10800
 AGAACGACAG TTGCGAGAAC AGTATGGTAC CAAAGTAGAT ATATCAATAA AAAAATCGGT 10860
 25 TGGTAAAATC TCATTTGAGT TTGATTCACA AGAAGATTTT GTGAGAATAA TTGAACAATT 10920
 AAATCGTAGG TATGGTAAAT AGTTACACAA TTTTATATAA TAACTCTTTG TGCAAGTGTA 10980
 AATAAATTGT AATCAGTGAC ATTTGATTCT AGAT 11014

30 (2) INFORMATION FOR SEQ ID NO: 92:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6022 base pairs
 (B) TYPE: nucleic acid
 35 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 92:

TCCCTTATG GAATTCACA TTCTAGTTA CATAATATAT ATTATAGGAA GTTATATGTG 60
 TGTAACGCAA AAGGTACCCT ACATCATAAT CATTATCTAA TATCGTCACA TAACTTACTT 120
 45 ATGCTATAAT CATGGTATTA TATTGTTGG AGTGATTGTA TGAGATTGT CTTTGATATT 180
 GATGGTACGC TTTGTTTGA CGGCCGATTA ATTGACCAGA CTATTATTGA TACATTGTTA 240
 CAATTACAAC ATGATGGTCA TGAACCTATA TTTGCATCAG CACGTCCGAT TCGTGATTG 300
 50 TTGCCAGTTT TACCATCAGT ATTCATCAG CACACATTAA TTGGCGCAA TGGTGCTATG 360
 ATTCACAGC AATCAAAGAT TTCTGTTATC AAACCAATTC ATACTGATAC ATATCATCAT 420

55

EP 0 786 519 A2

	GCTGCACAAC TTGACGCTGn AGAACGCGAT TTTTGAGCGT TTAGATCCAC ATAAGCTGGC	540
	CAGTTGTATT GATGTTGCAA ATATCGACAC GCCAATCAAG AKTATTTTAT TAAATATAGA	600
5	CCCGGCACAA ATTACAATA TATTAGACGA GCTAGATAAA TACCATCAAG AATTGGAAAT	660
	GATTCAACAT TCAAATGAGT ATAACATTGA TATAACAGCG CAAAATATTA ACAAATATAC	720
	TGCATTACAA TATATATTTG ATGCAGATGT TAAATATATA GCATTTGGTA ATGACCACAA	780
10	TGATATTGTC ATGTTACAAC ATGCTAGTAG TGGCTATATT ATAGGACCAT CAGAAGCATA	840
	CACACACGCA ATATTGAAAC TTGATAAAAT CAAACACATC AATAATAATG CACAAGCTAT	900
	TTGCAAAGTC TTAAATCAT ATAAATAAAA ACACCCCTAT CAAATGATAA TCATTATCAA	960
15	TCGATAGGGG CTATTTTAAT AAAATTCGTC CTCGAACATT TCTTCCTCTT CATCTAATCC	1020
	AAATAATTCT GCCATTTCTC CATGTTCAAT TAACATGTTT AAATATGCAT CGCGGAGTTC	1080
	TTCTTCACTC ATATCATTAA TCATTTCTTT AAGACTATCA ATCCACATAT TTCTGCGTAA	1140
20	TTGATAGTCT TCTTCAACTT CGTTTAAACAT CATTATATGT TTATTTGCTG CTTCTGGACT	1200
	AGCTGTAAAG AGTAATGCAA TCATATGTTT ACATATCACT CGTCTTCCAT CAGCATGAGG	1260
	ACAATTACAT ATGGATTTTC TAGGATGTTT CATATCAATA TAACAACGAT ATACTTTGTT	1320
25	GCCACTGCCC TTTACTTCAG CCTCATGCTG CGTTTCTGAA AATGATTTTA AGTTAATGAC	1380
	GCATTCACCT TGATAATAAT TAAAGCCTCT TTCTATAGAA CGAATACTTG CAATATCAAG	1440
30	TAATCCCATT AATGATCTC CTTTTTATTA TTATTTTAA ATAAAGAAA TAAATAGAT	1500
	AAGTGCTAG ATTAATAATC TTGATTTATC TATATTTAT AACAGTCTA GAATTATCGC	1560
	ATTCTTAAAT AACTAATATG AAAATGCTTG CACTAATTCT TTTGTATAAG GGTGTCTATC	1620
35	AACATTAAAT AATTCCTCTA TTGCAAAATC ATCGACTATC ATGCCATCCT TAAGAACGAT	1680
	AATTCTATTA ACTAAGCGTT GTAACACGGA TAAATCATGA GAAATAACGA TAAATGATT	1740
	TAAGTTCGTA ATCGTTTTCG CTTTAAATAT ATTGATTACA TTTTGTTTAC CTATAACATC	1800
40	TAAATTTGAA GTTATCTCAT CACATATTAA AACGCGAGGC TGTGCTAATA ACGAACGCAT	1860
	GACATTAAAT CTTTGTAATT GTCCGCCACT CACTTCGCTT GGTAATTTAG TCAATAATTG	1920
	CGCGTTTAAAC TCAAAAGTAG ATAAATGTTG TAATAATAAT TGATCCTGAG CAGTATTATC	1980
45	AGTTAGACCT CTGTAATAAT ATAACGCTTC TTTTAAATGAG GTCTCAATCG TCCAATCAGG	2040
	GTTAAAGCTA GTTAAAGGGT GTTGAAAAT CGGTAACACA GCATTGTCAC TTAAGTAAAT	2100
	CTCTCCTTTA ACAGGTTTAA ACAAGCCAAG AACCAATGAA GCGAGCGTAC TTTTACCACA	2160
50	GCCACTTTCG CCTAAAATAC CAACATTTTC TCCATCAGGT ATAGTAATAT TGATATCTTG	2220
55		

EP 0 786 519 A2

CCCTCTTTAA TTGTGTTCTA TATTTAATTA GACGTTCACT ATACGGATGC AAATGCTCAT 2340
 ACTTGAAATG ATTAATATTA CCTCGTTCAA TGATTGACC TTCTTTTAAA ACATAAATGT 2400
 5 ACTGACAATA TTTCAATACA TGACTTAAGT TATGTGTGAT AATAAATAAT GTTTGACCAT 2460
 GTTCTAATAC AATATGCTGT AATAAATCCA TCACTTGATT ACCGTTCAAA GCATCCAATG 2520
 ATGCAACTGG TTCGTCTGCA ATGATTAATT TAGGCTCCAA CATGAGAACG CTTGCTATGT 2580
 10 ATACGCGTTC AAGTTGGCCC CCAGAAAGTT GGAAACTATA TTTATTTAAT ATATCTTTGC 2640
 TTTGTAAATT AAGCCACGAC AAAGCCTTAT CAACTTTGGA CAAAGCCTCT TCTTTACTAC 2700
 CTTTATAATG CTTACGATAA ATCGCAGTTA ACTGTTTACC TAATTTAGTA TGGTCGTTAA 2760
 15 AACTTTCTGC ATAATTTTGA GAAATATAGC CAATTGTATG ACCATAATAT TGACTCAATC 2820
 TACTAACATT TTCCCCATCA AATTGGTACG AATCATACGT GCAGCTTAAA TCAAATGGTA 2880
 AATATTCAAG TAAAGCTTTA GCAATCAAAC TTTTCCAGC GCCGCTCTCT CCAATCAAGG 2940
 20 CATTAATCTG TTGACTAAAA ATTTTCAAAT CAATCCCTTT AATAAGAGAT TTCTCACTAG 3000
 TATTCTTTAT TGTAAATTT TGTATATCAA TGAGACTCAT CATATTCACT CCGTTGTTTC 3060
 AGCAATCTAT CTCTTAGTGC ATCACCAGTT AAATTAAAAA TTAAATAGT TATAGCAATG 3120
 25 ACTGAAGCAG GTGCAATCAA CATAATTGGA TGAGACGAAA TAAATCAGC ACCTTGTGTC 3180
 AACATAGCGC CCCaCTCTGG TGTGGCGGT TGTGCACCTA ACCCAATAAA TGATAGTGAA 3240
 CTTATATATA GAATGATTTT ACCGAAATCA ACGACCATCA AAACGATAAT AGCCGGTATA 3300
 30 ATTTTAGGTG TTAAATGACG TATTAATATT GTTCTGTGG GTACATGAAA TAATTGTGCC 3360
 ATTTTATAT AAGGCTTATT CATTTGCTA TTAACATAC TTCTAGTCAA CCTTGTGTAA 3420
 35 TTCATCCATT TTATTAATGT AATTGAGATA ACTAAATTC ATAAAGATGG TTGAAAAAA 3480
 CTGCTAAAG CAATCATGAT GATAAATTCT GGAATACTTA GACCAACATC AATAAACCTT 3540
 AACACTAATC GTTCAATCCA CCCTTTTTTG TATCCGGCAA ATAGACCTAG TGTAACACCT 3600
 40 ATGACAACGA TAGCTATTAA TGTTAAACA GTAACAAACA ATGTTGAACG TGCACCGATA 3660
 ATAATTCGGG TAAATAAATC TCTCCATAA TCATCAGTTC CTAATAAATG CAACCAACTA 3720
 ATAGGTTCAA AAGTTTGTGA TAAATTGACT TTGGTTGCAT TTCACTACT GACAAAGAAT 3780
 45 TGCAGTACAA TTACCACAAA AATAAATGCA ACGAATACAA AAAATATCAG GTTATTCTTT 3840
 GAAAATATTT TATGCATGAC GGTCACTACT TTCTGATATC AATGGTGTAT TGGTTTGTAT 3900
 TTTTGGATTT CCTAATTGTA AACGCTGCTT CGGATCAAGT AATAACGTTA ATAAATCAGC 3960
 50 AATCGTATTG ATAATAACAA CGAAGAAGCC AATAAATAAC ACGCATCCTT GAATAACAGG 4020

55

	ATTTTCAATC ACTACAGTAC CACCTATTAG ACTGCCAAGT GAAATCCCTA GTAATGGGAT	4140
	AATCGGCAAA ATTGTTGGTT TTAGTAAATC ATGAATTAAA ATATAACGTT CATTCATACC	4200
5	GCGTAATCTT GATGCTTGTA CGATATTACT TTGCAATAAC ATCAATAAAT TAGAACGCAC	4260
	TAAACGAATG ATGTATGCAC ACATACCTAA AGATAGCGTG ATTACAGGTA ATATAAACTG	4320
	ACTTAGTATA ACGCTATCTA TATTCATTAA ATTTGTGACA ATAAATAATA AAATAATACC	4380
10	GATAAAGAAC GCTGGTAAAC TAATCGATAG TGTGAGATC ACTCTAATCA CTTTATCCGT	4440
	CCACTTATGA AATCGTTTGG CTGCTATAAT GCCGAGCGGT ATAGATATGC ATAACGACAC	4500
15	TACTAATGTT GAAAATGATA TGAGTAATGT TATGGGTGCA TAGTTGAATA ATATCTGTGT	4560
	TACCGGTTCT TTTGATTCAA AACTTTTTCC TAAATTAAAA TGTAATAAAT GATTCAATCCA	4620
	ATGCCACCAC TGTACCAATA AAGAATCATT TAATCCCAAT TTATCTTTGG TTGCATTTAT	4680
20	TTGTTCCGTC GACACTTGTG CTACATCAAG ATGTAATATT TTATCAACAG GATTGCCTGG	4740
	TGATAATTTT ATTAATGA ATGTAAGTGT AGAAATAACA AATAAACAA CTATCATTTG	4800
	CATCAGTCTA TACAACATAG ACTTTATTAT GAACATAATA GTCCCCCTCC TTGTGTAAGT	4860
25	TACTAACACT TTCTTTTAC ATGAGAATGG CGCATGTATA TGCAACTTAC ATATTAAGAA	4920
	CTAACGTTCA TTATAGTATT ATCCATAAAG AAATTGAAGT ATATTTAATT TTTTAACAAA	4980
	ATCATTATAA AATATAATAT TTTGAATCAA GTCAACCATG TAAAATATAA AAAAGTCAAA	5040
30	ACAAAAACAA CTATAGCACT GTATTCCATC TCTTTGAAA TAATTGTTAC TGCAGTGTA	5100
	CTTAAAGTC GATGATTTTG TGCATATAGT TGTGGAATAT TATTTTTTAT CTTTACGGCG	5160
	AAGTTCAGCG CCCTCATAGC CGTATTTTTC AATTGCTTT TCTAATTTAC GCGCTTTTCT	5220
35	TTCTTTACGC CAATTCTAG TAAAATACCA TAATAGAAAA CTAATTAATA AACTCATAAT	5280
	CGCTAAAAAT GCAGCGTATC CTAATAATGG TTGATATTTT ATATCTTGAA AATTGGAAT	5340
	AAAAAATGCA AGCACACCTA ATATAACAAA TGTAATTACT GCAGATACAA ACCATTTATT	5400
40	TAAAACTAAG CAACAGAATA TTGTTAATAA AATCATTATT AATGTTGTGA TCCATAAATA	5460
	ATTAGGCATA TCGAATAATG TCATATTCAT TCTCCTTTTA TTTCATTACT TTCCTTGAT	5520
	ACATTTTATT ATAAATTTTT AAAAATTAA ACAATAGCAG TCAGTTTCAA GCAATATTCT	5580
45	ATCTACTAAT AGAAAAATCA TTGTTCCCTG CGACATGGAA ATCGTAACAT TATCGTTTAG	5640
	GAGACAAAAT TATGTATAAT GAATGTATTA TACCAAAGGA GTGATTATAT GTCTCAAGGT	5700
50	TTACCTTTAA GAGAAGATGT TCCTGTTTCA GAAACATGGG ATTTAGTAGA CTTATTTAAA	5760
	GATGATCAAC AATATTATGA AAGTATTGAC GCTCTAGTAC AACAAGCAAA TCAATTCAT	5820

55

GAAAATATTT TAATTGCCTT AGATCGCTTA AGTAATTATG CAGAACTACG TTAAAGTGTA 5940
 GATACTAGTA ATATCGAGGC ACAAGTATTG AGCGCTAAAT TATCTACTAC ATACGGTAAA 6000
 5 ATTGTTAAGC CAATTATCCT TT 6022

(2) INFORMATION FOR SEQ ID NO: 93:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 476 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 93:

CCATCAATAA TGTATACATG ATTGGCATCA TATCCCCCTT TAATTAGAGA GCTACGTACA 60
 GTTTGTYTTA TTAAAGTAGA ACTAATAAAT AACCATCTCT TATGTGCACA AACACTTCCC 120
 20 GCAACAATTG ATTCAGTTTT ACCAACCCGT GGCATACCTC TAATGCCAAT CAACTTATGA 180
 CCTTCTTCTT TGAACAATTC AGCTAAAAAG TCTACTAACA AGCCTAAATC TTCACGCTCA 240
 25 AATCGAAAGG TTTTCTTATC TTTTGCATCT TGCTCAATAT ATCTTCCATG TCTTACTGCA 300
 AGACGGTCTC TTAATTCTGG TTTTTTAAGC TTTGTTATTT CAATTTCAAT TATACCACGA 360
 GCTATTTGCT CAAAACGTTT AACTTTTTTCA AGATTGTCTG TTTTAATTAA AAGGCCTCGT 420
 30 TTACCTTGAT CAACACCATT AATTGTAACA ATACTTATAC CTAACATACC TAATAA 476

(2) INFORMATION FOR SEQ ID NO: 94:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 3633 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 94:

AGAAATACAA CGAAGCATAT AAATATAACC GATCTTTTTT CTAATTGAAT ATTAAGTAAG 60
 TGTATGTACT TTCTGGAAGT AGCACCTAGT rGGATTGtTc CTCCTACAAC AGGCCAAAAA 120
 45 TTTTATTTTT TAACTGGCTT AACAGTGTTT AGTTTTTCAT ACTCTTCTCT ACTAATTTTG 180
 GCGCACCTTT TTGGAATGAA CCAATTAATA AATGGAAAAA AGTATACAAG CCAAGTTCTT 240
 ATTACATCGA CCATTAAATA CTCATCATCA TACTTAATAA CTCTGTATTT CGGATTTTTA 300
 50 TTGATAATTT CGGTTTCACA AAGCAATAAT TATCACTTCC TATTAATAAC AAATTCACAC 360

	TTATATGACC TTAAATATAT AACATGAATC TTTTGTCTA TTATTGAAGA CATATTTATA	480
	AAGAAAAATA GCATTGTCAT AATAACCCAA GCAATAAATA CTATAATATT TTGGATAGAT	540
5	AAACTAATCA TTACATCTAA GAACATGATT gATAATCCAC CACAGAAAAA ATAAGAAAAT	600
	AGTACAAAGC AAAGATTCTT GAATGATGGA AAAATCATAA TTTTCCATT GCTACTCCGA	660
10	TCATTATAGA TAGATAACTT TACTTTCTGA TTTAAATATA TATAAAACAC TAGAATACTT	720
	AATAATAAAA CCGAACAAAT GATAATAACG CAATTTTTTT CTAAATGAGA ATCAGGTATA	780
	TATATTTTAT CTCTAAACAT AGTGCCAAAT AAAAGTATGC TACCTATAGC TGGCCATAAA	840
15	GCTTTaTTTT TAACTGGTTT GACAATATTT AAATTATCAA AATCTTCTCT GCTGATTGG	900
	ACATATTTTT TTGGTATTAA CCAATTAATA AACGGAAAGA ACAAACATAA CCAGGTGCTT	960
	ACTAAATCAA TCATCAGATA GTCGTTTTTA TATTTAATAA TTCTATATCT GGGATTTTTG	1020
20	TTTCAACTC TAACCTCGCA AAGCAATATC TCCACTTCCG TCTCGTTGGT TTTATATCTA	1080
	ATACACTTTC AGATACTTTA TAAGTGTTTT GTATTTTAGT AACATACTAT TTCCTGTTT	1140
	ATTACTTAAC TTACGAACTA CAATCTAAGT TTAGTAATTT CTATTGCTTT TTAAGTTTGG	1200
25	CATAAACCTT TTTATTACTA ATTGAGCCCA TGCTTATTAG AAAGAAAAAA ATTGTAATAA	1260
	TAATCCACAT AATAAATACC AGTAGATTTT GAGGTTTTAT AGTCATTAGC CATATTAAAA	1320
30	ATAATATAGA ACAACCTCCT AATAATAGAT ATGTGAAAAC TATAAACTT CCATCTTTAA	1380
	AAGTAGGCAC TAATATAACC CTATTTTCAT TATCTAGATT ATCATCATAT ATCTTTAGTT	1440
	TAAGCTTTTT ATTAAAGTAA ATGTAAAATG CTGCAATACC TATAAATCCT ATAAACATA	1500
35	AAGATATTAA AATCTTATTA TCTAATTGAA CTTCAAACGT ATGTACATAT TTCCGTAAAA	1560
	TAACTACAAA TAAAAACGAA CTACCAGTAA CTGGCCAGAA AATATTATTT TTATTTTGTT	1620
	TATCAACATT TAAATTTTCA AGTTCCTTCT CACTAAGTTT TGCATACCTT TTGGGAATGA	1680
40	ACCAATTAAT AAAAGGAAAA AAGTATACAA GCCAAGTGCT TACTAAATCA ATTAACAAAT	1740
	ACTCATCATT ATATTGAACG ACTTTATATC TCGGATTTTT ATTAATAACC TTAATATTAA	1800
45	AAAGCAAAAC TCACCACGCC CATTTCATTG GATTTATATG ATTGCTAATA ATATTTTATG	1860
	CTTCACTAAC AGCATTCCCA AACTATCCA TGGATTTTTT TGTAGTTTTT TTAACAACAT	1920
	CTATACTATT ATCGATTTTA TGCCCTACCC AGTCTACTTT ATCTTTTAAT CCAAAAATAT	1980
50	TATTTTGATA AATTAAATCT GTTCCTAATG CAAATACTGT ACTCATAGCC AAACCTGCTA	2040
	AAATCACCCA TCCTACTGGA TTACTTCCTA AAACAAAAGT CGCTAATCCA GCTCCAAC TG	2100
55	CTGTCCCTGC AGATCCAGCT GCAAGCGTgC ATACCATTAT GCGACAACGC CTCTCCAAAT	2160

EP 0 786 519 A2

	CCTTTACCTA GGTATTTTCC GCCTTTTGCA AATTTACTAC CATTTTCTAT AAACACATTA	2280
	CCTGATGTAC GTTTGACTTC CACAAATGAA TTTGGACCTG CTGGGCCTTT CACTCCACCT	2340
5	GCTGTATTGa TAAATACACC GAATTTACTT GcATTTATAC CGTCTTGCTC TAAAAGTGTT	2400
	GACGTAATAT CTAATCCTAT ATCTCTTTTA ATACTGTCTT TATTGTCATT TATATATTTT	2460
	AATATACTTT TCGGGATATC GTCTTCTGGA TGTTCCTTGG CATATGCCTT TATAACAGCA	2520
10	AAGTCTGCTT TATTTAAAGT TTCTTTCTCT GCTTTATGTT CAATTTTCCC CATAGCAACT	2580
	TTCAAATATT TTTCATGACT TGCTTTGGCC CAATCAAGTT CTTTACCTGA AGGAATATTA	2640
15	AATTGATTTG TTGAAAAGTT CCAAAAATTC TGCGCTTGGG TAAGTCCTTG TTGGACAATT	2700
	TTTTGAAATT CTTCAACTTC TTAAATATT TCTGGTGATT TTTGATTAAA CTCACGCAAT	2760
	TTGCGTAGCT TCTCTTCTAA TTCATGTTTT TGTTGACCTA ATGTTCTGAT TATTTGTTGG	2820
20	TTCGATGAAA TGGCTTGCTG ATTATCGGAA GCATGCTTTT TCAAATTGTT ATTCAAATTT	2880
	TCATATCGCG TAATTTGTTG ACTTAATGAT CTGATATCTT CTTCAAGCTC TGATTCTTTT	2940
	AAAGATATGC TATCAACCTC ACTCGTATAA CGTGACACAA AATTaTCGCA AGCTTGCTTC	3000
25	GTTAAATCAC TCAATGTTTT CATACTTGTT GATAATGGAA TTAACACCGT ACTAAAAAT	3060
	TGCTTAGCTG ACGTATACGC TTTCCCTTTA AGCGCATCAT CATTAATAAA TTGAGTAATT	3120
	GCTTTTTTCCA ACGCATCATA ATTTGAATTC ATTGTTTGAC TCAAATTTCC CACACTTGAA	3180
30	GCTTGGTTTC GAGATCTGTC TAAATACATG TCAATACTCA TCGGCATGCT CCTTTTTCAA	3240
	AAATATATGA TTTTCAAAC TTTTAAAATC AAATGCTTTT TACATCTACA AAGTTGTAAA	3300
35	ATTTTAAAC TCGGCGATGA TTATTTCTTA TGTAAGGAG TCTAGATGCA GGTAATTTGA	3360
	GATAACATGT CGCCTTTTTT CTTATTTTAG CATATGGATA TAATGGTGTC TTTGTATATT	3420
	CGCAATTAAT CAATAAAAT TATCTTTCAA TATTTTAATT TTATTGCGAC AACATCCTTA	3480
40	ACATTAAATA TATTAATATC TCAAATATA TTCACTATTA AAATATGTCA TCAGTTGTTA	3540
	AAAGTATTTT CTCATCATGC GAAATATCAA AACGTATCTA AAATACGAAT AAGTTTATAC	3600
45	AATCACACAA CATCATCATT CAAAATTTTA TTG	3633

(2) INFORMATION FOR SEQ ID NO: 95:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 2365 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

	TGATACGAAt GCATTACAAT TCATATGCAA CATACAATTC CTTCTACAGC AAATGAAGTG	60
	AAACAAATAG TTGATGTGAC ATCTGTAGCA GAAAATGATA CGCATTAGTC ATAAAATTAA	120
5	ATGGAAATGT CGATGAAGTG TATCAGCAAT TACAGCGATT AATTAAGAAT GCTAATGTCTG	180
	AAGAGAGTGA GAATACTGAC AATATTAATA GTCAAGATAC AAGTTATACA CCTCAAGTAA	240
10	AAGTAACAAC ACCAATTTTA GTGAAAGCAC CAATCGCTGG TCGTCGTATT TTACTIONAAG	300
	AAGTAAGAGA TTCAATTTTT AGAGAGAAAA TGGTAGGTGA AGGCTTAGCA ATCAAAGCTC	360
	ATGAAGAATC CAAAGTAATC GCACCGTTCA ATGGTTTAAAT ATCTATGATT GTACCAACTA	420
15	AGCATGCAGT TGGTATTCAA TCAGAAGACG GTGTGGACAT AGTCATTCAAT ATTGGCGTGA	480
	ATACAGTTGA CTGGAAGGT AAAGGGTTCA AGTGCTTTGT AAAGCAAAAT GATCATGTTG	540
	AAGCAGGGCA AACGTTGTTG CAATTCGACC AGCAATATAT ACAACAACAA GGCTACAATG	600
20	CTGACGTTAT TGTCGTTATT AGCAACTCTG CCGATTTAGG AAAAGTAGAA CTGACAATGA	660
	ATGAAATCAT TACGACTGAA GATGTTATTT TAAAATATT TAAAACTAG GAGTGTGTTG	720
	TAATAATGAC AAAATTACCG CAAAATTTCA TGTGGGGTGG CGCTCTTGCC GCAAATCAAT	780
25	TTGAAGGTGG ATATGATAAA GGTGGTAAAG GGTAAAGTGT AATTGATGTT ATGACGAGTG	840
	GTGCACATGG CAAAGCACGT CAGATTACAG AATCTATAGA TCCCAATCAC TATTATCCAA	900
	ATCATGAAGG TATTGATTTT TATCATCGTT ATAAGGAAGA TATTGCCTTG TTTAAAGAAA	960
30	TGGGATTGAA ATGTTTACGT ACGTCGATTG CGTGGACACG TATCTTTCCG AATGGGGATG	1020
	AAGATGTGCC AAATGAAGAA GGACTIONGCT TTTATGATCG TATCTTTGAT GAATTAATTG	1080
35	CACAAGGTAT TGAACCTGTT GTGACGTTAT CACATTTTGA GATGCCACTT CATTTAGCGA	1140
	AACATTATGG TGGATTTAGA AATAGAGAAG TTGTCGATTA TTTTGTGCAT TTTGCGCGTG	1200
	TTGTATTTGA AAGATATAAA GATAAAGTTA CATATTGGAT GACGTTTAAAT GAAATTAATA	1260
40	ATCAGATGGA CACATCAAT CCTATCTTTT TATGGACGAA TTCTGGGGTA GCATTGACAG	1320
	AAAATGATAA TCCTGAAGAA GTCyTGTATC AAGTAGCACA TCATGAACTT TTAGCCAGTG	1380
	CyTTAGCAGT TCGTCTTGGT AAAGaGATtA ATCCgAaGTT TAAGATTGGr ACmATGATTt	1440
45	CAmATGTACC CmTTTATCCa TAwTCGTGTC ATCCGAAAGA TATGATGGAA GCACAAATTG	1500
	CGAATCGCTT ACGTTTCTTT TTCCCGGATG TCCAAGTGAG AGGTTATTAT CCAAGCTATG	1560
50	CTAAAAAAT GTTGGCACGA AAAGGATATG ATGTTGGATG GCAAGAAGGG GACGACAGTA	1620
	TTTTACAGCA GGGCACGGTT GATTATATTG GCTTTAGTTA TTACATGTCT ACGGCTGTAA	1680
	AACATGATGT TGATACTACA GTTGAAAACA ACATCGTCAA CGGTGGTTTG AATCATTCTG	1740

55

GATATACATT GAATGTGTTA TATGATCGTT ATCAGTTACC ACTTTTTATT GTGGAAAATG 1860
 GTTTTGGTGC AGTTGATGAA GTGGTAGATG GACATATTCa TGATGATTAT CGCATTGAAT 1920
 5 ATTTAAAAGC ACATATTACA GCAGCGATAG AAGCAGTTGA TCAAGATGGT GTAGATTTAA 1980
 TCGGTTATAC ACCGTGGGGA ATCATTGATA TTGTTTCATT TACAACCGGT GAAATGAAGA 2040
 AACGCTATGG TTTAATATAT GTTGATCGAG ATAATGATGG TCATGGCAGC ATGGAACGCT 2100
 10 TGAAAAAAGA TTCGTTCTAT TGGTATCAAC AAGTGATAGC ATCAAATGGA GATAAATTAT 2160
 AAAGGTATAT TATAAGTATT TTAGGGTTAG AGCCCCGAGAC ATAAATTAAT ATAGTAGGAC 2220
 CTACAGTGTT ATAATGGCGG gCCCCCAACA CAAAGAATTT CGAAAAGAAA TTCTAcAGGT 2280
 15 aATGCaAGtT GGCGGGGcCC AACACAGAGA AATTTCGAAAA GAAATTCTAc AGGTAATGCA 2340
 AGTTGGGGAA GGACAGAAAT AAATT 2365

20 (2) INFORMATION FOR SEQ ID NO: 96:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 11050 base pairs
 (B) TYPE: nucleic acid
 25 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 96:

CTGCGATACG ATTTGTTGAA AGTGGGGAAA ACAAAAAAGT TATCATTACC AATTTAGAGC 60
 AGGCATACGA AGCTTTGATT GGTAATAAAG GTACACACAT TCACATGTAG CACTTTATCA 120
 35 CGCGACAAAA CATTAAATAT GTTCTCCGT TGATTCAAAT GAAAAAGTTG TCTGCTGACA 180
 CTTTGCAAGG TTTGAAGGAG TTAACTTAT GACAGAAAAC TTTATTTTGG GTAGAAATAA 240
 TAAATTAGAA CATGAATAA AGGCATTAGC AGATTACATT AATATACCAT ATAGTATATT 300
 40 ACAACCATAT CAAAGTGAAT GTTTTGTCAG ACATTATACG AAAGGCCAAG TTATTTATTT 360
 TTCGCCACAA GAAAGTAGCA ATATTTACTT TTTAATTGAA GGTAACATTA TTAGAGAACA 420
 TTACAATCAA AATGGAGATG TATATCGTTA TTTTAATAAA GAGCAAGTAT TATTTCCAAT 480
 45 CAGTAACTTA TTTCATCCGA AAGAGGTAA CGAATTGTGT ACAGCATTAA CCGATTGTAC 540
 AGTTCTTGA TTGCCTAGAG AATTGATGGC CTTTTGTGTC AAAGCTAATG ATGATATATT 600
 TTTGACACTT TTGCATTAA TAAATGATAA TGAGCAGCAA CACATGAACT ATAACATGGC 660
 50 ATTAACAAGT AAATTTGCTA AAGATCGAAT TATCAAATTG ATATGCCATC TATGTCAGAC 720
 AGTAGGATAC GATCAAGATG AATTTTATGA AATCAAACAG TTTTAACTA TTCAACTCAT 780

55

EP 0 786 519 A2

TGAAAACTT GTTGTTAAAG ATCATAAAAA TTGGTTAGTA AGCAAACATT TATTCAATGA 900
 TGTATGTGTT TAATATACAA TGTAAAATGA ATAAGTTGAA CATGAGGTCT AACGTACATT 960
 5 TATACGTTAG GCCTTTTTTG CTAGCATGAT GAATAATTTA AAATGTTAGT TAAATTTGAT 1020
 TGTTGAAATT ACAGTAAAT TTAAGGTGAT GAAAAATTTA GAACTTCTAA GTTTTTGAAA 1080
 AGTAAAAAAT TTGTAATAGT GTAAAAATAG TATATTGATT TTTGCTAGTT AACAGAAAT 1140
 10 TTTAAGTTAT ATAAATAGGA AGAAAACAAA TTTTACGTAA TTTTTTTCGA AAAGCAATTG 1200
 ATATAATTCT TATTTTATTA TACAATTTAG ACTAATCTAG AAATTGAAAT GGAGTAATAT 1260
 TTTTGAAAAA AAGAATTGAT TATTGTGCGA ATAAGCAGAA TAAGTATTCG ATTAGACGTT 1320
 15 TTACAGTAGG TACCACATCA GTAATAGTAG GGGCAACTAT ACTATTTGGG ATAGGCAATC 1380
 ATCAAGCACA AGCTTCAGAA CAATCGAACG ATACAACGCA ATCTTCGAAA AATAATGCAA 1440
 20 GTGCAGATTC CGAAAAAAC AATATGATAG AAACACCTCA ATTAAATACA ACGGCTAATG 1500
 ATACATCTGA TATTAGTGCA AACACAAACA GTGCGAATGT AGATAGCACA ACAAACCAA 1560
 TGTCTACACA AACGAGCAAT ACCACTACAA CAGAGCCAGC TTCAACAAAT GAAACACCTC 1620
 25 AACCAGCGGC AATTAAAAAT CAAGCAACTG CTGCAAAAAT GCAAGATCAA ACTGTTCCCTC 1680
 AAGAAGCAAA TTCTCAAGTA GATAATAAAA CAACGAATGA TGCTAATAGC ATAGCAACAA 1740
 ACAGTGAGCT TAAAAATTCT CAAACATTAG ATTTACCACA ATCATCACCA CAAACGATTT 1800
 30 CCAATGCGCA AGGAACTAGT AAACCAAGTG TTAGAACGAG AGCTGTACGT AGTTTAGCTG 1860
 TTGCTGAACC GGTAGTAAAT GCTGCTGATG CTAAAGGTAC AAATGTAAAT GATAAAGTTA 1920
 CGGCAAGTAA TTTCAAGTTA GAAAAGACTA CATTGACCC TAATCAAAGT GGTAACACAT 1980
 35 TTATGGCGGC AAATTTTACA GTGACAGATA AAGTGAAATC AGGGGATTAT TTTACAGCGA 2040
 aGTTACCAGA TAGTTTAACT GGTAATGGAG ACGTGGATTA TTCTAATTCA AATAATACGA 2100
 40 TGCCAATTGC AGACATTAAA AGTACGAATG GCGATGTTGT AGCTAAAGCA ACATATGATA 2160
 TCTTGACTAA GACGTATACA TTTGCTTTTA CAGATTATGT AAATAATAAA GAAAATATTA 2220
 ACGGACAATT TTCATTACCT TTATTTACAG ACCGAGCAAA GGCACCTAAA TCAGGAACAT 2280
 45 ATGATGCGAA TATTAATATT GCGGATGAAA TGTTTAATAA TAAATTACT TATAACTATA 2340
 GTTCGCCAAT TGCAGGAATT GATAAACCAA ATGGCGCGAA CATTTCTTCT CAAATTATTG 2400
 GTGTAGATAC AGCTTCAGGT CAAAACACAT ACAAGCAAAC AGTATTTGTT AACCTAAGC 2460
 50 AACGAGTTTT AGGTAATACG TGGGTGTATA TTAAAGGCTA CCAAGATAAA ATCGAAGAAA 2520
 GTAGCGGTAA AGTAAGTGCT ACAGATACAA AACTGAGAAT TTTTGAAGTG AATGATACAT 2580

55

	ACCAATTTAA AAATAGAATC TATTATGAGC ATCCAAATGT AGCTAGTATT AAATTTGGTG	2700
	ATATTACTAA AACATATGTA GTATTAGTAG AAGGGCATT ACGACAATACA GGTAAGAACT	2760
5	TAAAACTCA GGTTATTCAA GAAAATGTTG ATCCTGTAAC AAATAGAGAC TACAGTATTT	2820
	TCGGTTGGAA TAATGAGAAT GTTGACGTT ATGGTGGTGG AAGTGCTGAT GGTGATTCAG	2880
	CAGTAAATCC GAAAGACCCA ACTCCAGGGC CGCCGGTTGA CCCAGAACCA AGTCCAGACC	2940
10	CAGAACCAGA ACCAACGCCA GATCCAGAAC CAAGTCCAGA CCCAGAACCG GAACCAAGCC	3000
	CAGACCCGGA TCCGGATTCTG GATTACAGACA GTGACTCAGG CTCAGACAGC GACTCAGGTT	3060
	CAGATAGCGA CTCAGAATCA GATAGCGATT CGGATTCAGA CAGTGATTCA GATTACAGACA	3120
15	GCGACTCAGA ATCAGATAGC GACTCAGAAT CAGATAGTGA GTCAGATTCA GACAGTGACT	3180
	CGGACTCAGA CAGTGATTCA GACTCAGATA GCGATTGAGA CTCAGATAGC GATTACAGACT	3240
20	CAGACAGCGA TTCAGATTCA GACAGCGACT CAGATTCAGA CAGCGACTCA GACTCAGATA	3300
	GCGACTCAGA CTCAGACAGC GACTCAGATT CAGATAGCGA TTCAGACTCA GACAGCGACT	3360
	CAGACTCAGA CAGCGACTCA GACTCAGATA GCGACTCAGA TTCAGATAGC GATTACAGACT	3420
25	CAGACAGCGA CTCAGATTCA GATAGCGATT CGGACTCAGA CAGCGATTCA GATTACAGACA	3480
	GCGACTCAGA CTCGGATAGC GATTACAGATT CAGATAGCGA TTCGGATTCA GACAGTGATT	3540
	CAGATTGAGA CAGCGACTCA GACTCGGATA GCGACTCAGA CTCAGACAGC GATTACAGACT	3600
30	CAGATAGCGA CTCAGACTCG GATAGCGACT CGGATTCAGA TAGCGACTCA GACTCAGATA	3660
	GTGACTCCGA TTCAAGAGTT ACACCACCAA ATAATGAACA GAAAGCACCA TCAAATCCTA	3720
35	AAGGTGAAGT AAACCATTTCT AATAAGGTAT CAAAACAACA CAAACTGAT GCTTTACCAG	3780
	AAACAGGAGA TAAGAGCGAA AACACAAATG CAACTTTATT TGGTGCAATG ATGGCATTAT	3840
	TAGGATCATT ACTATTGTTT AGAAAACGCA AGCAAGATCA TAAAGAAAAA GCGTAAATAC	3900
40	TTTTTTAGGC CGAATACATT TGTATTCGGT TTTTGTGTTG AAAATGATTT TAAAGTGAAT	3960
	TGATTAAGCG TAAAATGTTG ATAAAGTAGA ATTAGAAAGG GGTGATGACG TATGGCTTAT	4020
	ATTTTCATTAA ACTATCATT CCAACAATT GGTATGCATC AAAATTTGAC AGTCATTTTA	4080
45	CCGGAAGATC AAAGCTTCTT TAATAGCGAT ACAACTGTGA AACCATTAAA AACTTTAATG	4140
	TTGTTACATG GATTATCAAG TGATGAAACG ACATATATGA GATATACAAG CATAGAAAGG	4200
	TATGCGAATG AACACAAATT AGCTGTGATT ATGCCCAATG TGGATCATAG CGCATATGCT	4260
50	AACATGGCAT ATGGTCATAG CTATTATGAT TATATTTTGG AAGTGATGA TTATGTTTAT	4320
	CAAATATTTT CACTTTCCAA AAAGCGTGAT GACAATTTTA TAGCAGGTCA CTCTATGGGA	4380
55		

TTATCTGCTG TGTTTGAAGC GCAAAATTTA ATGGATCTAG AGTGGAATGA TTTTTCAAAA 4500
 GAGGCCATAA TTGGCAATCT TTCAAGTGTT AAAGGAACTG AACATGATCC GTATTACTTG 4560
 5 CTAGACAAAG CTGTAGCTGA AGATAAACAA ATTCCAAAAT TGCTCATTAT GTGTGGTAAA 4620
 CAAGACTTTT TATATCAAGA CAACTTAGAT TTTATCGATT ATTTATCACG CATAAATGTT 4680
 CCTTATCAAT TTGAAGATGG ACCAGGAGAT CATGATTATG CATATTGGGA TCAAGCGATT 4740
 10 AAGCGTGCTA TAACATGGAT GGTGAATGAT TAATTATTTT TTGGAAAATA TGTGGCTGCA 4800
 TTAAATACAC AGAGTGAGAG ATACAACTA TTTACGCACG ACTAACATTT CTAAGTGTTC 4860
 AAATTATTTT TGTATTAATA TGATTGGCGC AATTGCTGA TACACAAAAA TGTTTCTCGT 4920
 15 GAAACTTAGA TTTAGCTTAT AGTTTATCA TCATTGTAT GACTTACATT ATAAATTTTA 4980
 TTATAATGAG GTTAACGCTT TGAAAGGAGT CATCATCATG TCGACCAATA AAAACGATTA 5040
 20 TGAGCATATG TTGTTTTATT TTGCATATAA AACCTTTATT ACTACCGCTG ATGAAATTAT 5100
 AGAGAAGTAT GGTATGAGTC GTCAGCATCA TCGTTTTTGG TTTTTTATCA ATAAATTACC 5160
 TGGTATTACT ATTAAATCAT TACTAGAAAT ATTAGAAATT TCTAACAAG GATCACATGC 5220
 25 AACACTTCAA AAATTAAAG AGCAAGGTCT CATTATTGAA AAAGTTTTCAG AGACTGATCG 5280
 ACGTGTCAA AAATTATATT CGACGGATAA AGGCGATCAA CTCATTGCTG AATTGAACAA 5340
 GGCACAAGAT GAATTATTGC AAAATATATA TCAACAAGTC GGTTCCGATT GGTATGATGT 5400
 30 GATGGAAGCA TTGGCTAAAG GCGACCTGG CTTTGATTTT ATTAAGCATT TGAAAGATGA 5460
 AAAAGAAAGC TAGCATCAGA AATGTTAAAA ATCTTCGCAT TCTTAAATT AAAAATATG 5520
 TCAAAAAGTG TATAATAAAA ACATATAATT TAATTGAACT CAGTTTCAAC ACATCTTAGA 5580
 35 AAGGAGTTTG AATGATGAAA AAATTAGCAG TTATTTTAACT ATTAGTTGGC GGTTTATACT 5640
 TCGCATTTAA AAAATACCAA GAACGTGTTA ACCAAGCACC TAACATTGAG TACTAAATTA 5700
 40 AACCATAAAA AATTCCCGAA CACCTTGTTA TAGTGCTCGG GAATTTTTTT ATGCTTTACT 5760
 TGAATATATC AAATATTATT TTTGCGCTTT CTGTATTTTC GATATTACCA CTAAATGATT 5820
 CTGATCTAGG TCCGTAAGCG TAGGTATTAA CATCCTCGCC TGTATGTCCA TCGGAAGTCC 5880
 45 ACCCTGTATA AGATTTATCA TTTACTGGCT TCTGAATAGC GTGTTGTAGG GCTTTTGTTT 5940
 GCGTTTCTAC TTCTGCGGAT TTTTCGCTT TTTCTTTTTT AAGTAGTCTT TTTAGCTTTT 6000
 TATTCTCTTT TTTAACCTTT TTCATATCAT CTTGTGAAAA TTCAAATCCA TAACCTTCAT 6060
 50 TAATAACTTT TTCAGGTCT TCACCTTAG CCAATTTTTT TGTATATAT GATCCAGAGT 6120
 GTTTCATAGA TTTAATCGGT TGAGGATTCC ATTCGTATCC TTTATCTTTA CCAATTGTTA 6180

55

EP 0 786 519 A2

	ATTGAATGGC GTCATCGAAT GCTTTTTCAA AACCTTCCAT TTCAGACATA ACGCCTGTAA	6300
	TATCGTTGGA ATGCGCTGAT TTATCTATAG AAGCACCTTC GACCATTAAA AAGAATCCTT	6360
5	TTTTATTGCG CTCAAGCTTA CTAAGTGCAC TTTGTTGCAT ATCAGCTAAT GATGGTTCGT	6420
	CTTTAGAAGC ATCTATTGCA AGTGGCATAT TTTTATCTGC AAACAAACCA AGAACTTTAT	6480
	CTTTATCAGA TTTTGATAAC TCCTTACTGT TCGTGGCAAG GTCGTAACCA TCTTTTTTGA	6540
10	ATTTTTTATC TAAATTGCCA TTACTTTTAC CGAAATATTT AGCGCCGCCG CCTAATAAAA	6600
	CATCAACTTT ATGCTTTCCG TTGATTTTAT CTTTATAAAA TTGTTTAGCG ATTTTCGTTTT	6660
15	TATCATCTCT AGAAGTCACG TGTGCAGCAT ATGCTGCTGG TGTGTCATCT GTTAATTCAG	6720
	CTGTTGAAAC AAGACCAGTC GACTTACCTT TTTCTTTTGC ACGTTCAAGC ACCGTCTTTA	6780
	CTTTCTGCTT GTTACTGTCA ACACCGATGG CACCATTATA TGTCTTATGA CCAGAACTAA	6840
20	AGGCTGTTCC GCCAGCTGCA GAATCAGTAA TATTCTGTTT TGGGTCATTT GAATATGTAC	6900
	GATTTGTGCC TTTTAAATAT GAATCAAAAG CAGTAGGGGT CATTTCTTTA GCATGCGGAT	6960
	CATTTTATA ATAACGATAA GCTGTGTTAA ATGATGGACC CATGCCATCG CCAACTAAAA	7020
25	AGATAACATT TTTTGGATTT TTAGTATTAC CAACCGCGAA ACTTTCATCT TTAGAACTTT	7080
	TATCGGATTG CGCAATTGCA GGTGTGACAG AACTAAAAAC CGTTGACACG ATAATAAGGT	7140
	TAGCAACTGC AAATTTTGTG GCTTTTTTAA CTGATAACAT AAGACATCCT CCTGAGTATA	7200
30	TGACTATGTC TTCAGTGTA AAGAGGAATT TtGAGCAATT ATGTAGTTTT AGTTAaAAAT	7260
	ATGTAAACAG AGTGATTTAG AATAACAAAA aATGAATATA TATGACAATT TGTTATAGAA	7320
35	AGCGTTAGAA TAGAAGCGTG TGAAAATATA GAATTAAATA TAATTTGAGG TGGAAAAATG	7380
	ATACTAGTAA TGTATCTCC ATTATTAATC ATATTCTTTA TAGTGTGTGC TATTTTAGAA	7440
	GAGCGTAAAC GTACGAAGAA AAAGCAACTC GAGAAAGAAA AAGCAAATAC ACTAAATCAA	7500
40	AATACAAATG ACACGGAAAG TTCAAATCAA GAGCCGTCAT TGCAGCAGGA TAAAGAACAA	7560
	AAAGATAACA AAGGATAATT CAATTGAAGG AAGAAGATTA TAGATGAAAA TATTAATTGT	7620
	TGAAGATGAT TTTGTTATAG CAGAGAGTTT AGCATCTGAA CTTAAAAAAT GGAATTACGG	7680
45	TGTTATTGTC GTTGAACAAT TTGATGATAT ACTGTCTATC TTAAACCAA ATCAACCTCA	7740
	GCTTGTATTG CTAGATATTA ATTTGCCAAC GTTAAATGGT TTTCATTGGT GTCAAGAAAT	7800
	CCGAAAAACA TCTAATGTGC CAATTATATT TATTAGTTCC CGTATTGATA ATATGGACCA	7860
50	AATTATGGCA ATACAAATGG GGGGAGATGA TTTTATCGAA AAGCCATTTA ACTTGTCAAT	7920
	AACGATTGCC AAAATTCAAG CATTATTGAG ACGAACTTAT GACTTGTCAG TAGCTAATGA	7980

55

EP 0 786 519 A2

	ACAAAACATA CAGCTATCTT TGACTGAATT ACAAATATTA AAGTTATTAT TTCAAAATGA	8100
	AGaTAAATAT GTAAGTAGrA CTGCTTTAAT TGaAAAATGT TGGGaATCAG AAAAcTCAT	8160
5	AGATGATAAC ACATTAGCTG TTAACATGAC GCGCCTGCTG AAAAAATTAA ATACTATTGG	8220
	CGTTAATGAT TTTATCATTa CAAAGAAAAA TGTCGGATAT AAAGTATAGG GTGAATGCAa	8280
	TGACCTTTCT TAAAAGTATT ACTCAGGAAA TAGCAATAGT CATAGTTATT TTTGCTTTGT	8340
10	TTGGCTTAAT GTTTTACCTG TATCATTTGC CATTAGAAGC ATATTTACTA GCACTTGCGC	8400
	TTATTTTATT ATTATTACTC ATATTCATAG GTATTAAATA TTTAAGTTTT GTAAAACTA	8460
	TAAGCCAACA ACAACAAATT GAAAACTTAG AAAATGCGTT GTATCAGCTT AAAAATGAAC	8520
15	AAATTGAATA TAAAAATGAT GTAGAGAGCT ACTTTTTAAC ATGGGTACAT CAAATGAAAA	8580
	CACCCATTAC TGCAGCACAA CTGTTACTTG AAAGAGATGA GCCTAATGTT GTTAATCGTG	8640
20	TTCGTCAAGA GGTtATTCAA ATTGaTAACT ATACAAGTTT AGCACTTAGT TATTTAAAGT	8700
	TATTAAATGA AACTTCTGaT ATTTCTGTCA CTAaATTTTc GATTAATAAT ATCATTcGCC	8760
	CAATTATTAT GAAATATTCA ATACAGTTTA TTGATCAAAA AACAAAAATC CATTATGAAC	8820
25	CTTGTCATCA CGAAGTATTA ACTGACGTTA GATGGACCTC TTTAATGATA GAACAATTAA	8880
	TAAATAATGC ACTTAAGTAT GCGAGAGGTA AAGATATATG GATTGAATTT GATGAGCAAT	8940
	CCAATCAATT ACACGTAAAA GATAATGGTA TCGGTATTAG TGAAGCGrAC TTGCCTAAAA	9000
30	TATTTGATAA GGGCTATTCA GGTtATAATG GCCAGCGCCA AAGTAActCA AGTGGGaTTG	9060
	GTTTATTTAT CGTAAACAAa ATTTCAACAC ACACAAACCA TCCTGTTTCA GTCGTATCTA	9120
35	AACAAATGA GGGTACAACA TTTACGATTC AATTTCCAGA TGAATAAAAA CTTTCAATAT	9180
	TGTAAGTATA CTAGTAACAT TTTTTTACTA ATTTAAATGT TATTAGTATT TTTTGTTTT	9240
	AATaTAGAAC TAACAAAGAA ATGAGGTGCA TGCCATGTTG CTAGAAGTGr AACATGTAAA	9300
40	AAAGGTTTAT GGTAAAGGTT TGAATGCTAC GACAGCACTT AATCAAATGA ATTTATCAGT	9360
	TGGAGCTGGT GaATTtGTTG CaATTATGGG TGAGTCTGGG tCAGGGAAGT CTACACTACT	9420
	AAATTTAATT GcTCTTTTtG ATGGACTAAC TGAAGGTGAC ATTATTGTGG ATGGCGCACA	9480
45	TTTAAATAAT ATGAAAAATA AAAGTAAAGC ATTGTATCGT CaACAAATGG TAGGTTTTGT	9540
	TTTTcAAGAT TTTAATCTTT TACCAACAAT GACGAATAAA GAAATATAA TGATGCCATT	9600
	AATTTTAGCT GGTGCTAAAC GAAAAGATAT AGAACAAAGG GTACATCAGT TGGCAGTACA	9660
50	ATTACATTTA GAGGGATTCT TAAACAAGTA TCCTTCTGAA ATCTCTGGGG GTCAGAAGCA	9720
	ACGCATTGCC ATTGCACGTG CATTAGTTAC TAAGCCGACG ATTTTACTAG CCGATGAACC	9780

55

TCAATTGGAA CAGACAATTT TAATGGTAAC TCATTCAAAT ATCGATGCGT CTTATGCAGA 9900
 GCGAGTCATT TTTATTAAAG ATGGGCGTCT ATATCATGAA ATATATCGTG GTGAAGAAAG 9960
 5 TCAATTAGCT TTTCAACAAC GAATAACAGA TAGCTTAGCA CTTGTGAATG GAGGAAGTGT 10020
 CAATATATGA AGTTAAGATT GTTATGnACA TAGTGCGACG TCAATTTATT ACGCAGCGAC 10080
 TTGTAATCAT TCCATTCATT TTAGCGGTAA GTGTACTATT CATGATTGAA TATACGCTTG 10140
 10 TGTCAATTGG GTTAAATAGC TACATAAAAC AGAAGAATGA CTTCTAGTA CCATTTATTA 10200
 TCATAGCTAA TTTTTTTATG GCGCTTTTAA CTTTTATTTT TATTTTCTAT GCAAATCACT 10260
 TTATGATGTC ACAAAGACGA AAAGAGTTTA GCATTTTTAT GACATTGGGC ATGACCAAGA 10320
 15 AAAGTATGCG TTTAATTGTA GTGATGGAAA CTATCTTACA ATTTGTGATA ATTTCACTCG 10380
 TTAGTATTGC CGGCGGATAC TTACTTGGTG CGATATTTTT CTTGTTTATA CAGAAAATAA 10440
 20 TGGGCAGTGA AGTTGCGACG TTAAGGTATT ATCCATTGTA CTCTGTAGCG ATGTTTATTA 10500
 CTTTGATTAT CATTGCTGTA TTAATGGGCA TGCTACTTAT ATTCAACTTG TTTAGTATTA 10560
 ATTTTCAACG GCCGATAACT TATCAACATC GTTCCGATTC TAGTGTCATA TCACGATGGT 10620
 25 TGCGTTACGT TTTAATTGTT ATAGGAAGCG CAACTATAT TTAGGTTACT TTATTGCAIT 10680
 ACAACAAGAT ACGACGTTTG GTGCCTTTTT TAAATATGG ATTGTCATAG GATTAGTTAT 10740
 TATCGGTACT TATGCATTTT TTGTAGGTAT AAGTGAAATA ATTATTAGTA TATTGCAGCA 10800
 30 GGTATCAAAA GTTACTATC ATCCACGGTA TTTTTTTGTG GTAGTTGGGA TCGTGTACG 10860
 TCTTAAATG AATGCAGTCA GTCTTGCAAC AATCACTTTG CTGTGTACAT TTTTGATTGT 10920
 AACGCTCACA ATGACATTAA CAACCTATCG TGATATGAAT CATACCATTA CGAAATTGAT 10980
 35 TACGAATGAT TakGATTTGT CATTTAGCGA CAATTCTAAG TCACAAaTAG AACGTCAACA 11040
 AACaATTGAG 11050

40 (2) INFORMATION FOR SEQ ID NO: 97:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 983 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 45 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 97:

50 CGACATAACG AGGCAAGGGT ACATGATACT TTAGCCTCGT TTTTGATATG TATTTTCTG 60
 AATATAAGGG CAATAGATGG TATTTTATAw TTTTTTTAAG GTAGTGATTA ACATAGATAT 120

55

TCAAGCGGAA CAGCATTATG CACCAGTATT AACGCATTTT TTAGATCCAA GAGGGCAATA 240
 TATATTGGAA GTGATTTGTG GCAGTTATGA AGATTTAAAC GTATCTTTTT ATGGTGGACC 300
 5 TAATGCTGAA AGAAAAAGAG CAATCATTTT GCCGAACAT TATGAACCTA AAGAAAGCGA 360
 CTTTGAATTA ACTTTAATGG AAATAGATTA TCCTGAAAAA TTCGTCACTT TAAAACATCA 420
 ACATATTTTA GGGACATTAA TGTCTTTAGG TATCGAACGC GAACAAGTTG GAGATATAAT 480
 10 TGTGaatGAA CGAATTCAAT TTGTTTTGAC AAGTAGATTG GAATCATTTA TTATGTTAGA 540
 ATTACAACGT ATTAAAGGCG CATCAGTTAA ACTTTATACT ATTCCAGTAA CAGATATGAT 600
 ACAATCTAAT GAGAATTGGA AAAATGAAAG TGCacAGTTA GTTCTTTAAG GTTAGATGTT 660
 15 GTTATTAAAG AAATGATACG TAAATCACGT ACGATTGCGA AACAACTAAT CGAAAAAAAA 720
 CGTGTTAAAG TGAATCACAC TATTGTTGAT TCAGCAGATT TTCAATTACA AGCAAATGAT 780
 20 TTAATATCCA TCCAAGGTTT TGGTAGAGCA CACATTACTG ACTTAGGTGG TAAAACATAA 840
 AAAGATAAAA CGCACATTAC CTATAGAACA TTATTCAAAT AGTAATGATT TAAGGAGGAT 900
 AACAAATGCC TTTTACACCA AATGAaATTA AGAATAAAGA GTTTTCACGT GTaAAGAATG 960
 25 GTTTTAGAAC CTACTIONAGT TGG 983

(2) INFORMATION FOR SEQ ID NO: 98:

(i) SEQUENCE CHARACTERISTICS:

- 30 (A) LENGTH: 10322 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 98:

TTTTGCAAAG CTTATTTTAT GTCAAACAGA TAGTCAATGT GAAACAAAGG TTAGTACATA 60
 40 TAATCATCCA GACTTTATGT ATATATCAAC AACTGAGAAT GCAATTAAGA AAGAACAAGT 120
 TGAACAACTT GTGCGTCATA TGAATCAACT TCCTATAGAA AGCACAAATA AAGTGTACAT 180
 CATTGAAGAC TTTGAAAAGT TAACTGTTCA AGGGGAAAAC AGTATCTTGA AATTTCTTGA 240
 45 AGAACCACCG GACAATACGA TTGCTATTTT ATTGTCTACA AAACCTGAGC AAATTTTAGA 300
 CACAATCCAT TCAAGGTGTC AGCATGTATA TTTCAAGCCT ATTGATAAAG AAAAGTTTAT 360
 AAATAGATTA GTTGAACAAA ACATGTCTAA GCCAGTAGCT GAAATGATTA GTACTTATAC 420
 50 TACGCAAATA GATAATGCAA TGGCTTTAAA TGAAGAATTT GATTTATTAG CATTAGGAA 480
 ATCAGTTATA CGTTGGTGTG AATTGTTGCT TACTAATAAG CCAATGGCAC TTATAGGTAT 540

55

	GAATGGTTTC TTCGAAGATA TCATACATAC AAAGGTAAAT GTAGAGGATA AACAAATATA	660
	TAGTGATTTA AAAAATGATA TTGATCAATA TGCGCAAAAG TTGTCGTTTA ATCAATTAAT	720
5	TTTGATGTTT GATCAACTGA CGGAAGCACA TAAGAAATTG AmTCAAAATG TAAATCCAAC	780
	GCTTGTATTT GAACAAATCG TAATTAAGGG TGTGAGTTAG ATGCCAAATG TAATAGGTGT	840
10	TCAGTTTCAA AAAGCGGGAA AATTAGAATA TTATACACCT AATGATATAC AAGTAGATAT	900
	AGAAGACTGG GTAGTTGTCG AATCTAAAAG AGGCATAGAG ATAGGTATTG TTA AAAATCC	960
	ATTAATGGAT ATTGCTGAAG AGGATGTTGT GTTACCTCTT AAAAATATTA TTCGCATTGC	1020
15	TGATGACAAA GATATTGATA AATTTAATTG TAATGAACGA GATGCTGAAA ATGCATTAAT	1080
	ACTATGTAAA GACATTGTAA GAGAACAAGG TTTGGACATG CGTTTAGTCA ATTGCGAATA	1140
	TACATTAGAT AAATCGAAAG TTATTTTTAA TTTTACGGCG GATGATCGTA TTGATTTTAG	1200
20	AAAATTAGTA AAAATATTAG CGCAACATTT AAAAACACGT ATCGAGTTGA GACAAATTGG	1260
	TGTAAGGGAT GAAGCCAAAT TGCTTGGCGG TATCGGACCT TGTGGTAGGT CGTTATGTTG	1320
	TTCTACATTT TTAGGGGATT TTGAACCACT ATCGATTAAAG ATGGCTAAGG ATCAAAATTT	1380
25	ATCATTAAAT CCAACTAAAA TTTCTGGTGC ATGTGGTCGT TTGATGTGTT GTTTAAAATA	1440
	TGAAAATGAC TATTATGAGG AAGTACGTGC ACAATTACCT GATATTGGTG AAGCAATTGA	1500
30	AACGCCTGAT GGTAACGGGA AAGTAGTTGC TTTAAATATA TTAGACATTT CTATGCAGGT	1560
	GAAGCTTGAG GGACATGAAC AGCCACTTGA ATATAAATTA GAAGAAATAG AACTATGCA	1620
	TTAAGGAGGC ATTATTACAT TTGGATCGCA ATGAAATATT TGAAAAATA ATGCGTTTAG	1680
35	AAATGAATGT CAATCAACTT TCAAAGGAAA CTTCAGAATT AAAGGCACTT GCAGTTGAAT	1740
	TAGTAGAAGA AAATGTAGCG CTTCAACTTG AAAATGATAA TTTGAAAAAG GTGTTGGGCA	1800
	ATGATGAACC AACTACTATT GATACTGCGA ATTCAAAACC AGCAAAAGCT GTGAAAAAGC	1860
40	CATTACCAAG TAAAGATAAT TTGGCTATAT TGTATGGAGA AGGATTTTCA TTTGTAAAG	1920
	GCGAATTATT TGGAAAACAT CGACATGGTG AAGATTGTCT GTTCTGTTTA GAAGTTTAA	1980
	GTGATTAATC AAGCACACTC AAATAGTGTT ATAATTATAA ATGAATATGG TTTGGATAAG	2040
45	TCTGAGACAA TGCATGTTTC AGGCTTTAAT TGTGTATAAA GTTTTGGTGA TTGCATAAGA	2100
	GATGGCGGTA CTAAATGTTA TTATTAAGTG TGCACGCagT ATCaTTAGTT ATAAAATGTA	2160
50	GCTGTTAAAA GTCAAAAATA CATCGAATGT AGTTAGGCAT ATAATATAAA AAGAGTTTTC	2220
	AATTACTCAA TAGAAAAAGG TTGCTTTCAT AGGAGTTAAA AATGTTAAAA GAGAATGAAC	2280
55	GATTTGATCA ACTAATCAAA GAAGATTTTA GTATTATTCA AAATGATGAT GTTTTTTCAT	2340

EP 0 786 519 A2

	TGGACTTATG TTCAGGCAAT GGGGTGATAC CCTTGTTATT GTTTGCGAAA CATCCACGAC	2460
	ATATAGAAGG TGTGAGATT CAAAAACAC TTGTCGATAT GGC GCGACGC ACATTTCAAT	2520
5	TCAATGATGT TGATGAATAT TTAACAATGC ATCACATGGA TTTGAAAAAC GTTACTAAAG	2580
	TATTTAAACC TTCACAATAT ACTTTAGTAA CGTGTAATCC GCCTTATTTT AAAGAGAATC	2640
10	AGCAACACCA ACATCAAAAA GAAGCACATA AGATAGCGAG ACATGAGATT ATGTGTACAC	2700
	TTGAAGATTG CATGATTGCA GCCCGTCATT TATTAAAAGA AGGTGGCAGG CTAAACATGG	2760
	TACATCGTGC AGAGAGACTA ATGGATGTCT TGTTTGAAAT GAGAAAAGTG AATATTGAAC	2820
15	CTAAGAAAGT CGTTTTTATA TATAGTAAAG TAGGGAAATC AGCACAAACG ATAGTAGTAG	2880
	AAGGTCGAAA AGGTGGAAAT CAAGGTTTAG AAATCATGCC CCCATTTTAT ATTTATAATG	2940
	AAGATGGTAA TTATAGCGAA GAAATGAAGG AAGTATATTA TGGATAGTCA TTTTGTATAT	3000
20	ATTGTAAAAT GTAGTGATGG AAGTTTATAT ACAGGATACG CTAAAGACGT TAATGCACGT	3060
	GTTGAAAAAC ATAACCGAGG TCAAGGAGCC AAATATACGA AAGTAAGACG TCCGGTGCAT	3120
	TTAGTTTATC AAGAAATGTA TGAGACAAAG TCTGAAGCAT TGAAGCGTGA ATATGAAATT	3180
25	AAAAC TTATA CCAGACAAAA GAAATTGCCA TTAATTAAGG AGCGATAGTA TGGCTGTATT	3240
	ATATTTAGTG GGCACACCAA TTGGTAATTT AGCAGATATT ACTTATAGAG CAGTTGATGT	3300
30	ATTGAAACGT GTTGATATGA TTGCTTGTA AGACACTAGA GTAAGTAGTA AACTGTGTAA	3360
	TCATTATGAT ATTCCAATC CATTAAAGTC ATATCACGAA CATAACAAGG ATAAGCAGAC	3420
	TGCTTTTATC ATTGAACAGT TAGAATTAGG TCTTGACGTT GCGCTCGTAT CTGATGCTGG	3480
35	ATTGCCCTTA ATTAGTGATC CTGGATACGA ATTAGTAGTG GCAGCCAGAG AAGCTAATAT	3540
	TAAAGTAGAG ACTGTGCCTG GACCTAATGC TGGGCTGACG GCPTTGATGG CTAGTGGATT	3600
	ACCTTCATAT GTATATACAT TTTTAGGATT TTTGCCACGA AAAGAGAAAG AAAAAAGTGC	3660
40	TGTATTAGAG CAACGTATGC ATGAAAATAG CACATTAATT ATATACGAAT CACCGCATCG	3720
	TGTGACAGAT ACATTAAAAA CAATTGCAAA GATAGATGCA ACACGACAAG TATCACTAGG	3780
	GCGTGAATTA ACTAAGAAGT TCGAACAAAT TGTAAGTATGAT GATGTAACAC AATTACAAGC	3840
45	ATTGATTCAG CAAGGCGATG TACCATTGAA AGGCGAATTC GTTATCTTAA TTGAAGGTGC	3900
	TAAAGCGAAC AATGAGATAT CGTGGTTTGA TGATTATCT ATCAATGAGC ATGTTGATCA	3960
50	TTATATTCAA ACTTCACAGA TGAAACCAAA ACAAGCTATT AAAAAAGTTG CTGAAGAACG	4020
	ACAACTTAAA ACGAATGAAG TATATAATAT TTATCATCAA ATAAGTTAAT CACTTTATCG	4080
55	ATTaTATGAA ATTTTAAACG ATTTTATAAA CGCAAGCTGT AATTTTAAAT GGTAAGTTAT	4140

	GTTTTTTAAT GTAAAATAAA TACATTGAAA GTAATAAATA CCTTAACATT GAATAAGATG	4260
	AAAATGAGAT GACGAGATAA ATGTTTCGCGT CCGTTGAAAT GCATAGAAAT CTTAGATATT	4320
5	ATTTGAAGTG AGACATTACG AGGAGGAACA GTTATGGCTA AAGAAACATT TTATATAACA	4380
	ACCCCAATAT ACTATCCTAG TGGGAATTTA CATATAGGAC ATGCATATTC TACAGTGGCT	4440
10	GGAGATGTTA TTGCAAGATA TAAGAGAATG CAAGGATATG ATGTTTCGCTA TTTGACTGGA	4500
	ACGGATGAAC ACGGTCAAAA AATTCAAGAA AAAGCTCAAA AAGCTGGTAA GACAGAAATT	4560
	GAATATTTGG ATGAGATGAT TGCTGGAATT AAACAATTGT GGGCTAAGCT TGAAATTTCA	4620
15	AATGATGATT TTATCAGAAC AACTGAAGAA CGTCATAAAC ATGTCGTTGA GCAAGTGTTC	4680
	GAACGTTTAT TAAAGCAAGG TGATATCTAT TTAGGTGAAT ATGAAGGTTG GTATTCTGTT	4740
	CCGGATGAAA CATACTATAC AGAGTCACAA TTAGTAGACC CACAATACGA AAACGGTAAA	4800
20	ATTATTGGTG GCAAAAGTCC AGATTCTGGA CACGAAGTTG AACTAGTTAA AGAAGAAAGT	4860
	TATTTCTTTA ATATTAGTAA ATATACAGAC CGTTTATTAG AGTTCTATGA CCAAAATCCA	4920
	GATTTTATAC AACCACCATC AAGAAAAAAT GAAATGATTA ACAACTTCAT TAAACCAGGA	4980
25	CTTGCTGATT TAGCTGTTTC TCGTACATCA TTTAACTGGG GTGTCCATGT TCCGTCTAAT	5040
	CCAAAACATG TTGTTTATGT TTGGATTGAT GCGTTAGTTA ACTATATTTT AGCATTAGGC	5100
30	TATTTATCAG ATGATGAGTC ACTATTTAAC AAATACTGGC CAGCAGATAT TCATTTAATG	5160
	GCTAAGGAAA TTGTGCGATT CCACTCAATT ATTTGGCCTA TTTTATTGAT GGCATTAGAC	5220
	TTACCGTTAC CTAAAAAAGT CTTTGACAT GGTGGAATTT TGATGAAAGA TGGAAAAATG	5280
35	AGTAAATCTA AAGGTAATGT CGTAGACCCT AATATTTTAA TTGATCGCTA TGGTTTAGAT	5340
	GCTACACGTT ATTATCTAAT GCGTGAATTA CCATTTGGTT CAGATGGCGT ATTTACACCT	5400
	GAAGCATTTG TTGAGCGTAC AAATTTTCGAT CTAGCAAATG ACTTAGGTAA CTTAGTAAAC	5460
40	CGTACGATT CTATGGTTAA TAAGTACTTT GATGGCGAAT TACCAGCGTA TCAAGGTCCA	5520
	CTTCATGAAT TAGATGAAGA AATGGAAGCT ATGGCTTTAG AACAGTGAA AAGCTACACT	5580
	GAAAGCATGG AAAGTTTGCA ATTTTCTGTG GCATTATCTA CGGTATGGAA GTTTATTAGT	5640
45	AGAACGAATA AGTATATTGA CGAAACAACG CCTTGGGTAT TAGCTAAGGA CGATAGCCAA	5700
	AAAGATATGT TAGGCAATGT AATGGCTCAC TTAGTTGAAA ATATTCGTTA TGCAGCTGTA	5760
50	TTATTACGTC CATTCTTAAC ACATGCGCCG AAAGAGATTT TTGAACAATT GAACATTAAC	5820
	AATCCTCAAT TTATGGAATT TAGTAGTTTA GAGCAATATG GTGTGCTTAA TGAGTCAATT	5880
55	ATGGTTACTG GGCAACCTAA ACCTATTTTC CCAAGATTGG ATAGCGACGG AATAATTGCAT	5940

AACCTCAAAT TGATATTAAA GACTTTGATA AAGTTGAAAT TAAGGCAGCA ACGATTATTG 6060
 ATGCTGAACA TGTTAAGAAG TCAGATAAGC TTTTAAAAAT TCAAGTAGAC TTAGATTCTG 6120
 5 AACAAAGACA AATTGTATCA GGAATTGCCA AATTCTATAC ACCAGATGAT ATTATTGGTA 6180
 AAAAAGTAGC AGTTGTTACT AACCTGAAAC CAGCTAAATT AATGGGACAA AAATCTGAAG 6240
 10 GTATGATATT ATCTGCTGAA AAAGATGGTG TATTAACCTT AGTAAGTTTA CCAAGTGCAA 6300
 TTCCAAATGG TGCAGTGATT AAATAACTGT ATTTTAAAAA ATTAGGAGAG ATAATTATGT 6360
 TAATCGATAC ACATGTCCAT TTAAATGATG AGCAATACGA TGATGATTTG AGTGAAGTGA 6420
 15 TTACACGTGc TAGAGAAGCA GGTGTTGATC GTATGTTTGT AGTTGGTTTT AACAAATCGA 6480
 CAATTGAACG CGCGATGAAA TTAATCGATG AGTATGATTT TTTATATGGC ATTATCGGTT 6540
 GGCATCCAGT TGACGCAATT GATTTTACAG AAGAACACTT GGAATGGATT GAATCTTTAG 6600
 20 CTCAGCATCC AAAAGTGATT GGTATTGGTG AAATGGGATT AGATTATCAC TGGGATAAAT 6660
 CTCCTGCAGA TGTTCAAAG GAAGTTTTTA GAAAGCAAAT TGCTTTAGCT AAGCGTTTGA 6720
 AGTTACCAAT TATCATTAT AACCCTGAAG CAACTCAAGA CTGTATCGAT ATCTTATTGG 6780
 25 AGGAGCATGC TGAAGAGGTA GCGGGGATTA TGCATAGCTT TAGTGGTTCT CCAGAAATTG 6840
 CAGATATTGT AACTAATAAG CTGAATTTTT ATATTTCAIT AGGTGGACCT GTGACATTTA 6900
 AAAATGCTAA ACAGCCTAAA GAAGTTGCTA AGCATGTGTC AATGGAGCGT TTGCTAGTTG 6960
 30 AAACCGATGC ACCGTATCTT TCGCCACATC CGTATAGAGG GAAGCGAAAT GAACCGGCGA 7020
 GAGTAACTTT AGTAGCTGAA CAAATTGCTG AATTAAAAGG CTTATCTTAT GAAGAAGTGT 7080
 35 GCGAACAAAC AACTAAAAAT GCAGAGAAAT TGTTTAAATT AAATTCATAA AGTTAAAAGT 7140
 GAGAAAGATC ACCGCCATAA ATGTAAACGA TGCTATATTC GTTTAATATG CTATGGTTCT 7200
 TTCTCACTTT TTAAATTAA AATATCGTGC ATGTGGAATA CGTGCGATAG AGATGGTTAG 7260
 40 AGCTTTGAAA TTAAGAATTG TAGGAAGGCG TTTTAAATGA AAATCAATGA GTTTATAGTT 7320
 GTAGAAGGAC GAGATGATAC TGAGCGTGT AAACGAGCTG TTGAATGTGA TACGATTGAA 7380
 ACGAATGGTA GTGCCATCAA CGAACAACT TTAGAAGTAA TTAGAAATGC TCAACAAAGT 7440
 45 CGAGGCGTTA TTGTATTAAAC AGATCCAGAT TTCCCAGGAG ATAAAATTAG AAGTACAATT 7500
 ACTGAACATG TCAAAGGTGT TAAACATGCG TATATTGATA GAGAAAAAGC TAAAAATAAA 7560
 50 AAAGGGAAAA TTGGTGTGTA ACATGCCGAC TTAATTGATA TTAAAGAAGC GTTAATGCAT 7620
 GTTAGTTCAC CCTTTGATGA AGCTTATGAA TCAATTGATA AATCTGTGCT AATAGAGTTG 7680
 GGGTTAATTG TTGGGAAAGA TGCAAGGCGC CGTAGAGAAA TTTTAAGTAG AAAATTGCGA 7740

55

EP 0 786 519 A2

	GCGGATGTAA GGCAAGCTTT AGAAGATGAA TGAGGAAGTG AAAATGTTGG ATAATAAAGA	7860
	TATTGCAACA CCATCAAGAA CGCGAGCGTT GTTAGATAAA TATGGCTTTA ATTTTAAAAA	7920
5	AAGTTTAGGA CAGAACTTTT TGATAGATGT GAATATCATT AATAATATCA TTGATGCAAG	7980
	TGATATTGAT GCACAAACTG GGGTGATTGA AATTGGTCCA GGCATGGGGT CATTGACAGA	8040
10	ACAATTGGCC AGACATGCTA AAAGAGTATT GGCATTTGAA ATTGATCAAC GTTTAATACC	8100
	TGTATTAAAT GATACACTAT CACCTTATGA TAATGTGACG GTGATTAATG AAGATATTTT	8160
	AAAAGCGAAT ATTAAAGAAG CTGTTGAAAA TCATTTACAA GATTGTGAAA AAATAATGGT	8220
15	TGTTGCAAAC CTGCCGTA CTATTACGAC GCCAATTTTA TTAAATTTGA TGCAACAAGA	8280
	TATACCAATT GATGGCTACG TGGTGATGAT GCAAAAAGAA GTGGCGGAAC GCTTAAATGC	8340
	TGAAGTAGGT TCAAAAGCAT ATGGTTCGTT ATCAATTGTC GTACAATACT ATACAGAGAC	8400
20	TAGTAAAGTA TTAACGGTAC CTAAATCTGT ATTTATGCCA CCACCTAATG TTGATTCAAT	8460
	AGTTGTAAAA CTGATGCAGA GAACTGAACC GTTAGTAACA GTAGATAACG AGGAAGCATT	8520
	CTTTAAGTTA GCAAAAGCAG CATTTCACAA AAGAAGAAAG ACAATTAACA ATAACATCA	8580
25	AAATTATTTT AAAGATGGTA AACAACACAA AGAAGTGATT TTACAATGGT TGAACAAGC	8640
	AGGTATTGAT CCAAGACGTC GCGGTGAAAC GCTATCTATT CAAGATTTTG CTAAATTGTA	8700
30	TGAAGAAAAG AAAAAATTCC CTCAATTAGA AAATTAAATG ATTGACAAAG CAAAGCACTA	8760
	TTGTTAAAT TTAAATTTTG TTTGACGAAA ACGTTGCAAA TATGGTATTA TGTAACCTGT	8820
	AGCGAGGTGG AGCAATATGC CAAATCAAT TTTGGACATC AAAAATTCTA TTGATTGTCA	8880
35	TGTAGGAAAT CGTATTGTAC TGAAaGCCAA TGGAGGCCGT AAGaaAACA TAAAACGTTT	8940
	TGGAATTTTA AAAGAAACAT ATCCGTCAGT TTTTATTGTT GAGTTAGATC AAGACAAACA	9000
	CAACTTTGAG AGAGTATCTT ATACATACAC TGATGTGTTA ACTGaAAATG TTCAAGTTTC	9060
40	ATTTGAAGAG GATAATCATC ACGAATCAAT TGCACACTAA ATAAGACATA TAGAGATGTT	9120
	AGACGTTTCT TAGTATAAGA AGTAAATATT ATGATAATTA TTTGAGTGTT GGGcATTATG	9180
	TTCAATACTC TTTTATTTTA CAAAATGTTT AACACTGATG TTTGCTTAT AGATTTTTC	9240
45	GTAAATGGAT AATTGTATTT ATAAACACAA ATACAAGTAA ATACTAAGTA ATTAGATGGA	9300
	GAAAATTACT TTTTATTAA AAAACACTA AAAACAAAT TAAAATGTCA AATATTAATT	9360
50	CTCTTTATGT TAAAATCATC ATATTAAGAT AACGAAAAGA GGGCGGAAA TGATATATGA	9420
	AACGGCACCA GCCAAAATTA ATTTTACGCT CGATACACTT TTTAAAAGAA ATGATGGCTA	9480
55	TCATGAGATT GAAATGATAA TGACAACAGT TGATTTAAAT GATCGTTTAA CTTTTCATAA	9540

AAATCTCGCA TATCGTGCAG CGCAACTATT TATTGAGCAA TATCAACTAA AGCAAGGTGT 9660
 AACAAATTTCT ATCGATAAAG AAATACCTGT TTCTGCTGGC TTAGCTGGAG GTTCGGCTGA 9720
 5 TGCAGCAGCA ACGTTAAGAG GATTGAATCG ACTTTTTGAT ATAGGGGCGA GTTTGGAAGA 9780
 ATTGGCTCTA CTAGGCAGTA AAATCGGGAC AGATATTCCG TTTTGTATTT ATAATAAAAC 9840
 10 TGCATATGT ACTGGAAGAG GAGAGAAAAT CGAGTTTTTA AATAAACCAC CTTAGCTTG 9900
 GGTGATTCTT GCTAAACCAA ACTTAGGCAT ATCATCACCA GATATATTTA AGTTGATTAA 9960
 TTTAGATAAG CGTTACGACG TACATACGAA AATGTGTTAT GAGGCCTTAG AAAATCGAGA 10020
 15 TTATCAACAA TTATGTCAA GTTTGTCTAA TCGATTAGAG CCAATTTCTG TTTCAAAACA 10080
 CCCACAAATC GATAAATTAA AAAATAATAT GTTGAAAAGT GGTGCAGATG GTGCGTTAAT 10140
 GAGTGGAAGC GGACCTACTG TGTATGGGCT AGCACGAAAA GAAAGCCAAG CAAAAAATAT 10200
 20 TTATAATGCA GTTAACGGTT GTTGTAATGA AGTGTACTTA GTTAGACTAT TAGGATAGAA 10260
 GGGTTGAAAA GATGAGATAT AAACGAAGCG AGAGAATTGT TTTTATGACG CAATATTTGA 10320
 TG 10322

(2) INFORMATION FOR SEQ ID NO: 99:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 5614 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 99:

GATTGATTAA ATGTTTTAAT CCACTTCAAT GCCTTCGATA AACTCTACAA TCGCGCTATT 60
 CATATAATTA TTCGATTTC TTTGTTTCAGC ATATGTCTCA TTAAATCCAG ACATAACTTT 120
 40 TTTAAAWGCG AAAATTGAAA TTGGTATCGT TACTAATAAG GCACTAGCCA TACGCCAATC 180
 AATGAGCATT ATGTATAAAA AGATAGCAGC TGACAAAAGT AAGTTTCCTA TAACTTCAGG 240
 AATCATATGT GCTAAAGGTA ATTCTATTGT TTCAACCTTA TCGACAAATA TATTTTTTAA 300
 45 TTCACCTATT TTCTTAGATT CCACTACGCC TAAAGGGAGA CGCATTAAAT TTTGAGCTAA 360
 TTTTTTACGA ATTTTCAGATA AAATTTTATA TGCCGTAATA TGTGATAGCA TCGTTGACGC 420
 50 TCCAAAACAA CACACTTGTG AAATATAAGC GATTAAAGCA ATAAAGATAT AAACCATAAT 480
 CGAATTAATC GTATATGTAT TGTTAATCAT CATTAAAATA ATTTTAAATA CTGCCCAATA 540
 AGGAACTAAT CCAGAAAAGA CACTGATGAT AGACAACAAA ATTGATAACA TAATTTTCCA 600

	ATATGTAACCT CCTkTCAATT AATAATCTAA ATTAAGCCGC TTATATTATT TATTTCACTG	720
	GATGATATAC ATAATATAAA TTTGTTATTT GTTAAAAATT AATACTTATT ACAAGTACAT	780
5	CATATATTAG TTGATAACGA TTATCAATGT CGCGTGGATT TGTGACACAT TTCTTTTAAA	840
	AATTCACAAG GTTATGGGGC AGAAATGATA AAGAGCCACT AATGATTTAT TATGTAGTGG	900
10	TTCTGGGAGT GGGACAGAAA TGATATTTTC ACAAAATTTA TTTCGTCGTC CCACCCCAAC	960
	TTGCATTGTC TCTAGAAATT GGAATCCAA TTTCTCTTTG TTGGGTCCCT GAATATAGCC	1020
	TTGTAGAGTC TAGTACATTG ATTTGTATCC CAATGTCCCT ATAATTGATT ATTCGCTTTA	1080
15	TCTAATGATC CTATGACTCA ACTATTAAAT CATTTTTCGA AATACTTAAT TCTAATATAA	1140
	TTAAATTCAT TTATTGTAAT ATTGCAAAAA TACATTGCAC ACCTTGTTC TCAATGCTAT	1200
	AATTAATTAC ATAATAAATT GAACATCTAA ATACACCAA TCCCCTCACT ACTGCCATAG	1260
20	TGAGGGGATT TATTTAGGTG TTGGTTATTT GTCACCTTTT TTATTGTTGC GCGTTCGTAA	1320
	CCAATGTGCA AAAAACGCAA CAAGACAGCC GCTTATAGCT GAAGTCATGA TGTTAATTAA	1380
	TAAATTGAAC ATCCGTCATA CACCTCCTCT CTGCGTTAAA GTAACGCCCG AGATGTTAGG	1440
25	CGACCATCAT ATTATATCAT TTATTTATTA TATTTACGC AATATTAAGG CTTAAGTAAA	1500
	GTTTTTTTTA GTGGTTTACG CTACTTTAAT TGCTATCTTT TAAAATCCAT TTAGATAATA	1560
30	TAAATGTGAT GGGTATCGTA ATAATTAAAC CAGCAAATGG TGCAATTTCT GCTGGCAAAT	1620
	TTAGCCAGGA TACAAATACA TATAATAAAA CTGTTTGTAA GCTTACGTTG ACAATCTGCG	1680
	TAATTGGAAG ACTAATGAAT TTTCTCCAAG TAGGTTTTAC CCTGTAAACA AAATAACAAT	1740
35	TCAAATAATA TGAAATCACA AAAGCGACTA GAAATCCGGT AATATGACTA ATCATATATT	1800
	CAATGTGTAA TAATTTTAAC AGCAATAAAT AGACAACATA ATAATTTAAC GTATTAATGC	1860
	CGCCAAACAAT GATAAATTTT AAAATTTTCAG CATGCGTTTG TGTTAGTTTC ATATGTGTAC	1920
40	TCCTCAACAT CAAAATATAT GCATAACTAC GTTCTCGAAC ATACTCGAAT ATGCGAGCCA	1980
	ATCCGCTTCA CTTCAAATAT GCTTATTTCA ATCTTTATAC CCTTTCACAG CAAATTTAGT	2040
	CTCTTTCCCC TCATCCTTAT ACGCCATTAT AATGTAACCTG ATTTATCGCG TGACTCATT	2100
45	GCACTATAGA GATTACTTTA GTTCACTAGT AATTTTATAT ACAATAAGAG CGACAACAGT	2160
	AATGAGAGGA TGTCTACTAT GCAATTACAA AAAATTGTCA TCGCTCCTGA CTCATTTAAG	2220
50	GAAAGTATGA CCGCACAGCA AGTTGGCAAT ATTATAAAAC AGGCTTTTAC TAATGTTTAT	2280
	GGGAATACCC TTCATTATGA TATCATTCGG ATGGCTGATG GTGGTGAAGG TACCACAGAT	2340
55	GCTTTAATGC ATGCAACAGG TGCCACTAAG TATACAGTCA TCGTTAATGA CCCTTTAATG	2400

	GCGGCAGCGT CAGGTTTGGG TTTATTAGAA AAAGAGGAAC GTAATCCTTT ATACACATCA	2520
	TCATATGGTA CCGGTGAACT AATTAAAGAT GCATTAAATC ATGGTGCTAA GACCATTATT	2580
5	TTAGGGATTG GTGGCAGTGC AACAAATGAT GGTGGTACAG GTATGCTAAG TGCACTAGGC	2640
	GTAAAGTTTA CTGATGTAAA CGGGGACTTA TTACAAATGA ATGGTGCTAA TCTTGCTCAC	2700
	ATTGCACAAA TCGATATAAC CAATCTAGAT TCGCGATTAA AAGAGGTGAC CTTTAAAGTG	2760
10	GCCTGTGATG TTTCAAATCC TTTATTGGGT GAAAATGGTG CTACCTATAT TTATGGTCCT	2820
	CAAAAAGGCG CTGATGCAAA GATGATACCA AAGTTGGATT TCGCAATGTC GCATTATCAT	2880
15	GATAAGATAA AAATGTGCAC AGGAAAGTCC GTTAATCAAA TACCAGGTTT TGGTGCAGCT	2940
	GGCGGTATGG GCGCAGCATT ATTAGCGTTT TGTGAGACAA CTTTAACAAA AGGTATTGAT	3000
	GTCGTCTTTG ACATTACAGA TTTTCATCAA AGAATTAAAG ATGCAGACCT CGTTATTACT	3060
20	GGAGAAGGAC GCATGGATTA TCAGACCATC TTTGGTAAAA CACCCGTAGG CGTTGCGTTA	3120
	GCTGCAAAAC AATATCATAT TCCTGTCTATC GCGATTTGTG GCAGTCTAGG CGAAAATTAT	3180
	CAACATGTTT ACGATTTCCG TATTGATAGT GCCTATTCTA TAATCTCTTC ACCTAGCACT	3240
25	TTAGAAGATG TCCTACAAAA TAGCGAACAA AATTTATTAA AACTGCAAC TGACATTGCT	3300
	CGTATTCTGA AATTACAATA ATGTCAAAGT AAATCATCAG CTTTATTATT TGCAGTTAAA	3360
	ACTTGAATGA GGTGAAACCC ATGAAAAGAA CTGATAAATA CCGTGATTCA TATCAATACG	3420
30	ACAATCAAAA CCAAATCAT CGTCGTCAAT CTGAAGACGC ATCGTATAGA CAACAATATG	3480
	CTAAAGGCGA TCCTGAAGAA CACCCGGAAC GATACTATAA TGGTAGAGAT TATCGAAGAG	3540
35	AACAAATTCT TGAAGAAGAA AACGAGAAAT CCCGCCGTTT AAAAAAATGG TTATATATCA	3600
	TTATTGCCAT TCTCTTAATT ATTGTCGCTA TTTTGTGTCAC ACGCGCCTTA CTTAACAATG	3660
	ATAGCGATAA AGTTAGTAAT GACCCTAAAG TCTCTCAAAA TTATAAAAAA CAAGTTGAAA	3720
40	ATCAAGACGG CCAAATTAAC CAGCAAGTAG ATAATGCTAA AGAAAATATT AAAACAACC	3780
	AAAAAACTGA TGACATTATT AAAAATTAC AAAATCAAAT CGACAACCTG AAGCAGCAAG	3840
	AACAAAACAA AGCTGATTCT AAGCTAACTC AATTTTATCA AGACCAAATC AACAAATTGA	3900
45	CAGAGGCAAA TAATGCACTT AAAACAATG CAAGCCAAGG TAAAATTGAA AGCATGTTAA	3960
	ATGATATTAA TACAAAATTC GACAGTATTA AATCTAAAT AGAAAGCTTA TTTAAAGATG	4020
	ACAATGGTGG CGCTAATTAA TTATTACACC TGCTTTGATG ATAAACATTA ATTCCCTATA	4080
50	CTTTATCTGT ATCACTACGT TATTCGTGAT GATGCATTAA GAGTATAGGG ATTTTTTATA	4140
	TAAACTTGTA TTCTAACTAC ATACAAATAC ACACAAAACG TATATAATTT ATATAATTAT	4200

55

TTATTGCTAA TTACGTTAGG CGTCATGACC GCTTTTGGCC CACTAACTAT AGATATGTAC 4320
 GTACCATCAT TACCTAAAGT GCAAGGTGAT TTTGGTTCTA CTACATCAGA AATTCAATTA 4380
 5 ACATTATCAT TCACAATGAT TGGTCTTGCA CTAGGCCAAT TTATCTTTGG ACCTTTATCC 4440
 GATGCTTTTG GTCGCAAACG GATTGCTGTA TCCATTTTGA TCATTTTCAT TTTGGTATCA 4500
 GGTTTGTCTA TGTTTGTGTA TCAATTGCCA TTATTCTTAA CTTTACGATT TATTCAAGGT 4560
 10 TTAAGTGGTG GTGGCGTCAT CGTGATTGCA AAAGCCTCTG CTGGTGATAA ATTTAGTGGC 4620
 AACGCACTCG CTAATTTTTT AGCATCTTTA ATGGTAGTTA ATGGCATCAT CACTATTCTT 4680
 GCACCATTAG CCGGTGGATT AGCTTTATCC GTAGCAACAT GGCCTTCTAT TTTCACAATT 4740
 15 TTAAGTATTG TGGCACTCAT CATTTTAATT GGCCTCGCTT CTCAATTACC TAAAACATCT 4800
 AAAGATGAAT TAAAGCAGGT GAATTTTAGT AGCGTCATTA AAGATTTTGG AAGTCTTTTG 4860
 20 AAAAAACCAG CATTATATTAT TCCAATGCTA TTACAAGGWT TAACTTATGT AATGCTATTT 4920
 AGTTATTCAT CTGCATCGCC ATTTATTACT CAAAAATTGT ATAATATGAC ACCCCAACAA 4980
 TTTAGTATCA TGTTTGCTGT TAACGGTGTA GGTTTAATCA TTGTCAGTCA AGTCGTTGCT 5040
 25 TTATTAGTAG AAAAATTACA TCGCCACATA TTATTAATCA TTTTAACTAT TATACAAGTG 5100
 GTAGGTGTTG CTTTAATTAT CCTGACACTT ACATTCCATT TACCACTTTG GGTCTTACTC 5160
 ATCGCATTCT TCTTAAATGT GTGTCCTGTG ACGTCAATTG GACCGCTTGG TTTCACAATG 5220
 30 GCTATGGAAG AACGAACAGG TGCGAGTGGT AACGCATCAA GTTTACTTGG CTATTCCAA 5280
 TTTATCTTAG GTGGCGCTGT TGCACCATTA GTTGGCTTAA AAGGCGAATT TAATACATCA 5340
 CCATATATGA TTATTATCTT CATTACAGCC ATTCTATTAG TCAGTCTACA AATCATTAC 5400
 35 TTTAAAATGA TTTAAAAGCA ACATGTCGCA TAACACTTCA ACATAATTAG AACCCTAGCA 5460
 AAGATATCTA TCTTTGTCAG GGTTCTTCTT TATGAATTAT GAGATCGAAT CTTCAACTAA 5520
 40 AATTACGCCT TCATAGCAAG GACATTTCTA TTCAATCACC CTTTAACAGG CATCCAAATT 5580
 TcTGTAATAT ATTTTTCCTT TGTAAGTATCA CCAT 5614

(2) INFORMATION FOR SEQ ID NO: 100:

- 45 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 9179 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

50

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 100:

55

EP 0 786 519 A2

	AAAGACAATG ATATGAAGTA TATGGATATC ACAGAAaAAAG TGCCAATGTC GGAATCTGAA	120
	GTTAACCAAT TGCTAAAAGG TAAGGGGATT TTAGAAAATC GAGGGAAAGT TTTTCTAGAA	180
5	GCTCAAGAAA AATATGAGGT TAATGTCATT TATCTTGTTA GCCATGCATT AGTAGAAACA	240
	GGTAACGGCA AATCAGAATT AGCAAAAGGC ATTAAAGATG GGAAAAAACG CTATTACAAC	300
	TTTTTTGGTA TAGGAGCATT CGATAGTAGT GCTGTTCGTA GTGGGAAAAG TTATGCTGAA	360
10	AAGGAACAAT GGACATCACC AGATAAGGCG ATTATTGGTG GTGCAAAGTT CATTTCGTAAT	420
	GAATATTTTG AAAACAATCA ACTGAATTTA TATCAAATGC GATGGAATCC AGAAAATCCT	480
15	GCGCAACATC AATATGCGAG TGACATTCCG TGGGCAGATA AAATTGCCAA ATTAATGGAT	540
	AAATCCTATA AGCAGTTTGG TATAAAGAAA GATGATATTA GACAAACATA TTATAAATAA	600
	GACATCGGTG CTAAAGGAG CTGGAACAAT TTATTGTTTC GAGCTCCTTT AGCGCATTCT	660
20	GAGTGTGTTA GTTAAATGGA TTTTAACCTA ACAAAAAACG CTATATAGCA TCAAATATGC	720
	TATATCCCAC ATCATTGTTA CAAATGTACA TGATGTAAAT GAATATTGCT GTCTAAATGT	780
	GCATGTAATA TACAATGGTG CAGATAATAC ACTTAAGTCC TTAAAAATGA AACGTTAgTT	840
25	CCAAGAGTCA TTTTAAACA ATAGTGCATG TGATAAAATA GAAAGAATG AAAAATATAG	900
	AGGTGACAAT ATGAAGATAG CAATTATAGG TGCAGGCATC GGTGGATTAA CAGCTGCTGC	960
	ATTATTACAA GAACAAGGTC ATACTATTAA AGTCTTTGAA AAAAATGAGT CAGTTAAAGA	1020
30	AATTGGCGCT GGGATTGCTA TCGGAGATAA TGTGCTTAAA AAAGTAGGTA ATCATGACTT	1080
	AGCTAAAGGT ATTAAAAATG CTGGGCAAAT CTTATCTACA ATGACAGTGT TAGATGACAA	1140
35	AGATCGCCTG TTAAGTACTG TTAAATTAAA AAGTAATACA TTGAATGTGA CGTTACCACG	1200
	CCAAACATTA ATTGACATTA TTAAATCTTA TGTAAGAGAT GACGCAATAT TTACAAATCA	1260
	TGAAGTCACG CATATAGATA ATGAGACAGA TAAAGTTACC ATACATTTTCG CGGAACAAGA	1320
40	AAGTGAAGCA TTTGATTTAT GTATTGGTGC TGATGGAATT CATTCTAAAG TGAGACAATC	1380
	TGTAAATGCT GACAGTAAAG TATTATATCA AGGGTATACA TGCTTTAGAG GTTTAATTGA	1440
	TGATATTGAT TTAAAGCATC CGGATTGTGC AAAAGAATAC TGGGGaAGAA AAGGaAGAGT	1500
45	AGGTATTGTT CCGTTATTAA ATAATCAAGC ATATTGGTTC ATTACAATTA ACTCGAAGGA	1560
	AAACAATCAT AAATATAGTT CGTTTGTTAA ACCTCATTTG CAAGCATACT TTAATCACTA	1620
	TCCAAATGAA GTTAGAGAGA TCTTAGACAA ACAAAGTGAA ACAGGTATCT TATTGCATAA	1680
50	TATTTATGAT TTGAAACCAC TCAAATCTTT TGTTTATGGT CGTACTATTT TACTAGGAGA	1740
	TGCAGCACAT GCGACAACGC CTAATATGGG GCAAGGTGCT GGACAAGCAA TGGAAGATGC	1800

55

	TAAATACGT GTCAACATA CTGCAAAAGT AATTAAGCGT TCTAGAAAAA TCGGTAAAAAT	1920
	TGCCCAATAT CGTAGTCGTT TATTTGTTGC AGTTAGAAAT CGTATTATGA AAATGATGCC	1980
5	AAATGCATTA GCAGCTGGAC AAATAAATT CTTATATAAA TCGAAAGAAA AATAATACAA	2040
	CAATATGAAA ACCCCCGTAT GTTGAAACGA GAGCTCAACA TATGGGGGTT CTTGTTTTTA	2100
10	TAATGTTATT ATAATAAATT CAATTATTAG TTAACGACAA ATTGTGGTTT CTCACCTTGA	2160
	ACGGCACTAA TTGCAGCATT AGCAACAATT TTAGACATCA TGTACCGTGC TTCAAATGTA	2220
	GCATTACCAA TATGCGGTGT TAATACTACA TTATTAAGTG ATTTTAAGTC ATCGGTAATA	2280
15	TCTGGTTCAA ATTCATATAC ATCAAGTGCA GCACCTTCAA TTTCATTATC TTTCAATGCT	2340
	TGCACTAGTG CTTGTTCTGT CACGATTGGA CCACGAGAGG CATTGATTAA ATACGCCGTA	2400
	GATTCATCA TTTTAAATTG TTCTGTATCA ATTAAATGAT GCATTTTAGG ATTATAAGCA	2460
20	GCGTTGATAG TGATAAAATC TGCAATCTTT AATAGTGTAT CTAAATCTAC ATATTTTGCA	2520
	CCGATTTCTC GTTCTTTTTT TTCTTTGCGA TTAGGTCCAG TGTATAGCAC ATCCATGTCA	2580
	AATGCTCTTG CACGACGAGC TACTGCACTA CCAATTTTAC CTAAACCGAT AATGCCGATT	2640
25	GTTTTCCCAG ATACTTCTCT ACCTCTGAAA AATAAAGGTG CCCATCCATC AAATCCAGTT	2700
	GTACGTGATA ATTGGTCCCC TTCAACAATA CGACGCGCTA CTGCAAGTAC TAATCCAATT	2760
30	GTTAAATCAG CAGTCGCGTT TGTGTATGCT TTAGGTGTGT TTGTAACATC TATACTTTTT	2820
	TCTCGGGCAT ACTCGATATC AATATTATTA AAACCAGCGC CATAGTTGGC AATGATTTTT	2880
	AAGTCTTTAC CAGCATCGAT AACATCTTTA TCAACGTTTG TAGATAATAA ACTAATTAAG	2940
35	GCACTCGCGT TTTTAACACC TTTAATTAAA GTGTCTTTAT CGACTAATCC TTTACCTTCA	3000
	TACATTTCAA CTTCAAATG TTCTTGTAAG AGTTTAAAC CTACTTCTGG TATtGCACCA	3060
	gCAACATAAm CTTTTtCCAT AAAAGAtCAC TCCTTTTATC TTAGTATAGT AGAAGATTAG	3120
40	ACAGTATACA ACTATGTCAT GATGTCTTGT GTATCAATGA TGTAAAGCGG TACTTTTGAT	3180
	GGAGGCGATA TAACTTAGGC ACTGTAGAAC TATGAATATT GTAATGTGGA AAAACTGGAT	3240
	CAATTAAATT AGATAACGTA GTTTTAAAGT TAATAGTATT AGAAAAAATT AATATTTTGA	3300
45	ATATGGGAGG AAATATAAAT AAGTAGGTGG CAACGAAAAA TAGCAAAAAA AGAGCTTCTC	3360
	CTATAAAGGA AAGCTCAAAG TTTTTTGATG ACATATGTAC TAGAATTAAG TTTCAAGACA	3420
	ATATGTATCA TCGTGTTTAT ATTAAATATG GATGTAGTTG TAGTTACCTG CTTCACTTGC	3480
50	AGAAATAGTT CTAGAACTTA CTGAGAAAGG TCCGCCACTA TAATTCATTT CTGAAATTGT	3540
	AACTGAACCA TCACTGTTTA CACTTTCTAC ATATGCAACG TGACCAAATG GTCCTTCAGA	3600

55

EP 0 786 519 A2

	AGCAGCAGCC CAATTATTAG CATTTCCCCA AGTAGAACCG ATTTCTCCGC CAACTTTATC	3720
	ATATACATAC CAAGTACATT GTCCTGCAGT GTATAAGTTA CCAGAATGTG AAATTGATGA	3780
5	TGTAGTTGTC GTAGTTGTCG TAGTCGTTGT AGTTTGAGTC GTGTTGTAGT TATAGTTGTT	3840
	GTAATTTGTA TAATTTTCAG CAGCATCTGC ATGATGTGCT TGACCTACTA ATGCTGTGCC	3900
	GATTCCTGCT GTTAACGTAG TTGCTGTTAC TAATTTTTTC ATGAATAAAG TCCTCCAAAG	3960
10	TTCTATATCT TTTTTTATAA ATAAAACGTA GCGACTGTTT TATTCTCACA TCTCGAATTG	4020
	ATGACAATAG TTACTTTAAC AAAATTAATG CTCTTGTGG GGAATGTTAT TGATTTGTAA	4080
15	AAGAATAAAA AAACTTTGAC TAATTTTGTA ATAAAAATTA GTCAAAGTTA CAATGAGATT	4140
	AACAGATAAT TAATAGGAAA TATTTATTTG TAATATGTTT AAATAAATCG AATTGTTAAA	4200
	GGTATTATAT ATTCTTGGCC ATTATAATAT TTGACACACG CAATAATTGT GAATACAAAA	4260
20	GATAATATTG AGAAAGCGAA TATGGATAAA ATACCGATAA ACGTAATGAT GAAACCTATA	4320
	ATAATAATGA AATCAATATC TGTAGCAATT AGGAAAACGC CTATTAAAGT GATAACGACT	4380
	AAAACGATAG ACCCAAATAAT ATAAGAAATC GTATAGTTAA GATAATTTTT TCCAGCACGA	4440
25	TCAACTAGTT TCGATTCATC TTTTTTCAAT AACCATATTA TCAGTGGACC AATAATAGAT	4500
	GTGAATAAAC TTAATAAATA GATAAGCATC GCCATAATGT TCTCATCATT GGATTTGCGA	4560
	TTCGGTTGAT GATTTGTTAC GTCGTTTATT TCAGTTGTCA TATTAGACAC TCCTTTGAAA	4620
30	ATTGTAATAT TATCTTTAAC TATAACAAAA TATAATCAAA AATAAACATG TTTATTAAAC	4680
	AATTATTAAA AATAAAAATA ATTGGTGGAC GTCGGCGTTT AAATAGGTTA ATTTAAGGTT	4740
35	ATATATACTT AACATTTATA ATGATGCGTA ATGAATTCGC ATCATTTTTA TATTGTCTTA	4800
	CGTATAATTT GTTTTTAATT TTAACCAAAG ATAGAAAGAG GGTGTTTAT GAAAATAGCA	4860
	ATTGTAGGAT CAGGAAATGG CGCAGTTACG GCAGCAGTAG ATATGGTGAG CAAAGGCCAC	4920
40	GATGTTAAAT TATATTGTCG TAATCAATCT ATAAGTAAGT TTCAAACGC AATCGAAAAG	4980
	GGCGGATTTG ATTTTAATAA TGAAGGTGAT GAACGTTTCG TAAATTCAC TGATATTAGT	5040
	GATGATATGG AATATGTTTT AAAAGATGCT GAAATTGTTC AAGTGATTAT TCCATCTTCA	5100
45	TACATAGAGT ATTATGCTGA TGTAATGGCA GAGCATGTAA CTGATAATCA GTTGATATTC	5160
	TTCAACATGG CTGCAGCAAT GGGGTCAATT CGTTTTATGA ATGTTTTAGA AGATAGACAT	5220
	ATTGAAACAA AACCACAACT AGCGGAAGcT AATACGTTGA CGTATGGTAC GCGTGTGAT	5280
50	TTTGAAAATG CAGCAGTTGA TTTATCTCTA AATGTACGTC GTATCTTCTT TTCAACATAT	5340
	GATAGAAGCT GTCTAAATGA TTGTTATGAC AAAGTTTCAA GTATTTATGA TCATTTAGTA	5400

55

	CCAACATTAT TGAATGTCGG TCGCATTGAT TATGCTGGCG AGTTCGCTTT ATATAAAGAA	5520
	GGAATTACTA AACATACAGT TAGATTACTT CATGCAATCG AATTAGAACG TTTGAATTTA	5580
5	GGCCGTAGAT TAGGTTTTGA ATTATCAACA GCTAAAGAAT CACGTATTGA ACGTGGTTAT	5640
	TTAGAACGTG ATAAAGAAGA TGAACCATTA AATCGTTTGT TTAATACAAG CCCAGTATTT	5700
	TCACAAATTC CAGGACCAAA TCATGTAGAA AGCAGATATT TAACTGAAGA TATTGCATAT	5760
10	GGTTTAGTAC TATGGTCAAG CTTAGGTCGT GTTATTGATG TACCGACACC AAATATAGAT	5820
	GCAGTAATTG TAATTGCATC AACCATTTTA GAGAGAGACT TCTTTGAGGA AGGCTTAACA	5880
15	GTTGAAGAAA TTGGTTTAGA TAAGCTTGAT TTAGAAAAAT ATTTAAAATA AATGATGGCT	5940
	TGAAGATAGA AAAGGATATA GCATTATGCA AAAGCAATAA ATTGAAGAAA AGAGGTTTCT	6000
	CATCAATAAG CGnAGGGGAC GATAGATGAT GAAAAGAAAA CCCACCTTTT TAGAATCAAT	6060
20	TTGACAATG ATTGTAATGG TTATTGTTGT TGTAACAGGC TTTGTGTTTT TTGATATTCC	6120
	AATTCAAGTA TTATTAAATTA TTGCCTCAGC ATATGCCACA TGGATTGCAA AACGTGTAGG	6180
	CTTAACATGG CAAGATTTAG AAAAAGGCAT TGCAGAACGT TTAAATACTG CAATGCCTGC	6240
25	AATTTTAATT ATACTAGCGG TAGGAATTAT AGTAGGCAGT TGGATGTTTT CTGGCACAGT	6300
	GCCAGCCTTG ATTTATTATG GCTTAGATTT ATTGAATCCA AGCTATTTTT TAATATCAGC	6360
	CTTTTTTATA AGTGCTGTTA CATCTGTAGC AACTGGTACA GCATGGGGCT CTGCATCAAC	6420
30	TGCAGGGATT GCACTTATTT CTATTGGTAA TCAATTGGGG ATTCCTCCAG GGATGGCAGC	6480
	GGGTGCTATT ATAGCAGGGG CTGTGTTTGG CGATAAAATG TCACCATTAT CAGATACAAC	6540
35	TAATTTAGCG GCGCTTGTTA CTAAAGTTAA TATATTTAAA CATATACATT CGATGATGTG	6600
	GACGACGATA CCTGCATCAA TCATAGGTTT ATTAGTATGG TTTATTGCTG GATTTC AATT	6660
	TAAAGGGCAT TCAAATGATA AACAGATTCA AACTTTGTGA TCAGAGCTTG CACAGATTTA	6720
40	TCAAATTAAC ATATGGGTCT GGGTCCCTT AATTGTGATC ATTGTTTGTT TGCTATTTAA	6780
	AATGGCTACA GTGCCAGCTA TGCTAATATC AAGCTTTTCT GCCATTATAG TGGGGACTTT	6840
	TAATCATCAT TTCAAAATGA CAGATGGTTT CAAAGCAACA TTTAGTGGTT TTAACGAATC	6900
45	AATGATACAT CAGTCTCATA TTTCATCCAG TGTGAAAAGC TTGTTAGAAC AGGGTGGTAT	6960
	GATGAGTATG ACCCAAATAT TAGTAACGAT ATTTTGCGGA TATGCATTTG CAGGTATTGT	7020
	AGAAAAAGCA GGATGTTTAG AAGTCTTATT AACTACTATT TCTAAAGGCA TCCATTCTGT	7080
50	AGGAAGTTTA ATATGTATTA CTGTTATTG TTGTATTGCG CTTGTATTG CTGCAGGTGT	7140
	TGCTTCGATT GTAATTATTA TGGTCGGTGT GTTAATGAAA GATTGTTCG AAAAATACCA	7200

55

	AATACCATGG GGAACATCAG GTATTTACTA TACGAATCAA CTTCATGTCT CTGTTGAAGA	7320
	ATTTTTCATA TGGACAGTAC CATGTTATTT ATGCGCAATT ATAGCAATTA TCTATGGTTT	7380
5	TACAGGGATA GGTATTAAAA AGTCATCGAA TTCACGTTTA ACTTAATGTG AGCGTGGAAT	7440
	ATATATAATA TGTTGAAACA CTTTAATCAT TTATAATTGT AGCGGTTATA ATTTGAAAAG	7500
10	GTTTTAACTT AGAATAAATA TCCTCTATGC ATATACTGAA TATGTTTTGT AGCGGAACAT	7560
	GTTGATATAT GTAATGTAAG TTTTATGTCA TGATTTGTAA TGAATAAATT AATTGAGAAT	7620
	TTGAAGGCAA GTATATTTGT AAGTACTTTA ACTAAAAATT TATCAATGTA TAGCCGATTT	7680
15	GACATGCCTA AATTTGGGTG TGTCAATGGC TGTATGTTGT TTATTCTTTA TTACAGAGTG	7740
	AATCGGATTG GTGAAAATCG AAATTTTGAG ATTTTACCA ATTCGATTTT TTTCATAGAA	7800
	ATTAAAAAAG CCAACAAGGC TCTTGAAACC TTGTTGGCGT AAACATAGCC ATCACTAATT	7860
20	AGTGAATGAA GTTATAACCA GCAGCTTGGC TAGCTGAGAT TGTACGTGAA GTTACAACAC	7920
	CTGGGCCATA ACCATAGTTC ATTTCTGAAA CTCTTACTGA ACCATTGCTG TTAACACTTT	7980
	CAACGTATGC AACGTGACCG TATGCACCTT GAGTTGTTTG CATAATTGCA CCAGCTTTTG	8040
25	GTGTATTGTT CACTGTGTAA CCAGCTCTTG CAGCTGCGTT AGCCCAGTTA CTTGCATTGC	8100
	CCCAAGTTGA ACCGATTTTA CCACCTACAC GATCAAATAC GTAGTATGTA CATTGACCAG	8160
	AAGTGATAAA GTTACGTCCT GAAGTATAAC CACTTGAGAT TGAACGGCCA TTTGATGATG	8220
30	GAGCCATAGT TGTAGTTACT TGAACATTGT TGCTTGAAGT GCTGTAGCTT GCACCTAAAC	8280
	CACCAGTACG GTAGCTGTTT GTGTTGTAAC TATTATAGTT ATTGTAGTTA TATGATTGAT	8340
35	TATTATTTGA GTAGTTGTTG TAACGGCTGT AGTTATTGTA GCTATAACCG TTGTTGTAAT	8400
	TGTTATAGTT ATTGTAACCA TTGTAGTAGT AATAGCTGTA GTAGCCATTA TCTTGGTTTA	8460
	ATTGACTTGG ATGCCAGTTA CCTTTCCATG TGTAATGGTA GTTACCTTGT GCATCAATAG	8520
40	TGTAAGTATA GCTATATGAT GTTGGGTCGT TTGGATTATA ACCGTAGTTA TCTTGCTCAG	8580
	AAGCATGAGC TTGATTTCTT GATGCAATTG CGATTGTAGC GAATCCTGCA GTTGCGATAG	8640
	TAGCTGTAGC GATTTTCTTC ATTTTAAAAA TATCCTCCTA AAAATTTTAA ATCTAAAATA	8700
45	TTTTCGTAAT GTCCGTGTGA CAAAATTAAT GTTATAAGTT ATCTCTCGTA ATTAAACGAC	8760
	AAGAAAGACT ATAACAGAAA TTAGCGTCCT TGTGTGCTTT GTTAACGTTT TGTAATTTTT	8820
	TGCTAATATC TTGACACAAT AGAATTTTAA AAGTATAGAA ATTTGCATTT TGCAAAACTT	8880
50	ATAACTACGG CATTCTTTGT GAAAACTGAA TGTTTCGAAA ATAAGTCTGT TACAAATTTG	8940
	TAATATTACT GAAAATTCTA AATGTATATT TTGTGCATAA TATAGGACTT TTAATCAGAA	9000

55

GGATGAAAAT GTATATTTAA TGGATAAAAT ATCCTAATTT AGCATAAAAA AATGTTTTAA 9120
TAAAAGTATT ATTTGATATA ATCGATTTAT GTTTTGTTAC TGCTAAAAAA CATGTGGCG 9179

(2) INFORMATION FOR SEQ ID NO: 101:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1868 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 101:

CCTTCAGCCA TTTGACTTCG ACATGAGTTG CCTGTACATA TAAAATAAAT TGTTTTTTTA 60
GTCATAACAA TCTCCTAATT AATTAAATA TGATAAGTGT TAGATACAAC CCTATGAGGG 120
TTATAAATAG TACTGGAATT GTAATGATGA TACCAGTTT AAAGTATGTG CCCCAGAAA 180
TCTTAACATC TTTTGTGTT AAGACGTGTA ACCACAGTAA TGTAGCTAAA GAGCCTATCG 240
GTGTAATTTT TGGACCTAAA TCAGAACCGA TAACATTCGC ATAAATTAGG CCTTCTTTTA 300
ACATGCCATG GACATTTGAT TGACCAATAG CAATCGCATC TATTAAAACT GTAGGCATAT 360
TATTCATTAT TGATGATAAA AACGCTGAAA TGAAGCCCAT TCCCAAATA GTGCTAAATA 420
GACCGTAATT GGAAATATAT TCTAATATT TAGCCAATAT TAAAGTAATG CCAGCATTTT 480
TTAAGCCGAA TACGACGATA TACATACCAA TTGAAAATAA TACTATATTC CAAGGTGCGC 540
CCTTAATGAC TTGCTTAATA TTTACAGCAT TTGATTACG AGCCAACATT AGAAAAATAA 600
AAGCAATGAT TCCAGTGAAT ATTGATACCG GAATTTTAGT AAATTTACTG ATTAGATAGC 660
CGAAAAGTAA TATAACTAGA ACAATCCaTG AAATTTTAAA TAGCTTTAAA TCATTAATGG 720
CATCFTTAGG ATGCTTTTATA TTATTATCAT CAAACGTTTT AGGTATCGCT TTTCTAAAAT 780
ATAACCACAA TACTATAATA CTTGCTAAAA GCGAGAATAA ATTAGGTATA ATCATTCTAC 840
TAAAATATCG AACGAATCCT ACATGAAAAT AATCAGCAGA TATAATATTC ACTAGATTGC 900
TCACGATTAA AGGTAAAGAA GTTGTGTCAG CTATAAAACC ACTCGCAATA ATAAAAGGGA 960
ATATGGCCCG CTTACTAAAA CCTATATTTT TAACCATCGC TAATACAATA GGCCTTAAGA 1020
TTAAcGTGCG CCATCATTG CGAAAAATGC AGCAACAATG GCACCCAATA ATATGATATA 1080
AACGAACATT TTAAACCAT TGCCTTTTGA AGCATGAAGC ATGTGAATAG CTGACCATTG 1140
GAATAATCCA ACTTTATCTA ATATTAATGA AATAAGAATG ACTGAGACAA AAGTCAAAGT 1200
AGCATTCCAA ACAATACCTG TTACTTCGAA AACATCGGAA AAACCTTACAA CACCAGTAAT 1260

	TAATACAAAT AATAAAGTTA CTAGAAAAAT GAGTGTGCT AAAGTTGTCA TCATTAGCAT	1380
	TCACCACTCT TAAGGTTATG ACAAATACAT CGTTGGTTAG AGGTATGAAC CTTAGACAAG	1440
5	TTATTAATTA CGGACTCAAA AATATTATGA TTgAGCTGGT ATAAATGTTT ATTTCCGATT	1500
	TTTCGTGTCG TAACTAAGTT GGTTTTACT AATGCTTTCA TATGrTAGCT AAGTGTAGGT	1560
	TGAGAGAATT GAAAATGTGC TAACAAATCA CAAGCGCATA ACTCTCCACA AGAAAGTAAA	1620
10	TCTAGTATTT CTAATCTGCT TGAATCTGAT AAACTTTTA AAAATGTTGC TAGTTCTTTA	1680
	TACGTCATAA CATACCTCCT AGACGTAAA TAGATTATCA TCTATATAGA TGAATGTCTA	1740
15	TGTTCTTTG GTATATTACA CGATATGACT ATGTAATTTA AATTTGGTTT TAGTATTAAA	1800
	AGGGTATTAA AGATAAATTA TAGATATTGA TTTTGCAAAA TATACTCTTT GTTCTGCATT	1860
	GAAAAAGG	1868

(2) INFORMATION FOR SEQ ID NO: 102:

- (1) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 15249 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 102:

30	ATTTATGAAA TCCATAGCnA TAAACATTAT TCTTGCATCG GCTATACAAA CAGTTACCGC	60
	AAGCAAATTT GTATATCAAC CTGGAATTGT GTTCACGTCA ATGGCaAATG CCGATGATGT	120
	GTTATCAGGC GATAGTTATT TTATGGCTGA ATTAAAATCT ATTAAGCGTA TTGTTGAAAT	180
35	TCCAGATAAT CAAAAAATAT ACTGCTTTAT AGATGAAAT TTTAAAGGTA CCAACACAAC	240
	TGAACGAATT GCCGCTTCAG AATCAGTACT ATCATTTTTA CATGAAAAAT CTAACTTTAG	300
40	AGTTATTGCA GCAACACATG ATATTGAGTT AGCTGAACTC TTAAACAAC GTTATGAAAA	360
	TTACCATTTC AATGAGGTAA TAGAAAATAA TAACATACAT TTTGATTACA AAATTAAGCC	420
	TGGCAAAGCA AATACACGTA ATGCCATCGA ATTATTAAAA ATCACTTCAT TTCCAGCAAA	480
45	AATATATGAA CGAGCAAAAG ATAATGTCCC GAAAATTTAG CATTTAACTT TAAACATAAA	540
	AACGTCAGCT ATCACATGAC AGAAGACTAT GAACAGTTTC AATAATGTTC ATAGTAATCA	600
	TGTTAATAAC TGACGTTTAT TTTATTCTGC AGAATACTCT TCTAAATCTA TATTGCTGTG	660
50	CCCATTTAAT GCTAAATCAG CAAATCGACC TTGCTGATAC AAATAGTGGC CGGCAACGCC	720
	TATCATTGCA GCATTATCTG TGCATAATTT AGGACTTGGG ATAGTTAATT GAATGTCATT	780

	AACAATTAAT CGCTGAACAC CATATTCTTT ACAAGCTTGA ATAGCTTTAA ACGTGAGCAC	900
	CTCTACAACA CTGTTTTGAA AGCTCGTTGC TACGTTAGCT TCAATGATTG GaATATTTT	960
5	TTGTCGTTGA TTGTGAAGTT GATTGATTAC GGCACCTTTC AACCCACTAA AACTAAAATC	1020
	ATAACTATCT TTATCCAACC AAACACGAGG GAATGAATAA GTATCTTCAC CTTCAGCAGC	1080
	CAACCGATCA ACTTGTGGAC CACCTGGATA ATTTAAACCA ATTGTTCTGT CCACTTTATC	1140
10	ATAAGCCTCA CCTACTGCGT CATCTCGTGT TTCACCAATG ACTTCAAATG ATAAATGATC	1200
	CTTCATATAA ACTAATTCAG TATGTCCACC TGAAACAATA AGTGCAATTA GCGGGAATGT	1260
15	TAATGGCTCT TCTATGTGAT TAGCATATAT ATGTCCTGCA ATATGATGAA CAGGAATAAG	1320
	TGGCTnATCG TAAGCAAATG CCAATGCTTT GGCTGCATTA ACACCTATTA GTAACGCACC	1380
	AATTAGTCCA GGGCCTTCTG TAACCGCTAT GGCATCAATA TCTTCTATTG ATACATCGGC	1440
20	ATCCCCTAGA GCCTCGTTTA TTGTTGCTGT TATACCTTCA ACGTGATGTC TACTTGCCAC	1500
	TTCGGAACG ACACCGCCAA ATCGTTTATG ACTTTCAATC TGACTIONAAA CTGTATTTGA	1560
	TAAATATCT CTGCCATTTT TTATAACACT AACGCTTGTT TCATCACAAC TTGTTTcAAC	1620
25	AGCTAGTATT AATATATCTT TAGTCATTTA AATTCACCCA CATAACCATT GCGTCCTCAC	1680
	CTTCACCATA ATAATTTTTA CGTTTACCAC CATATTGAAA TCCTAAATTT TCATATACAT	1740
	GTTGTGCCAC TTTATTATTA ACTCTTACTT CTAACTCAT CACATCACAA GTGTGACTTG	1800
30	CATAGTTTAT TCCGTATTTT AAAAGCATTT GACCTAAACC ATAGCCTCTA TAATTATCAT	1860
	CGATTGCAAC TGTTGTAATT TGAGCTTGAT CGATAACAAT CCATAAACCT AAATAACCAA	1920
35	TAATTTGTTG TTCAAATTCt AAGACAAAAT ATTTGCAAA GTTATTTTGC TCTATTTTAT	1980
	GATAAAATGC GTCAATTGTC CAAGAAGTGT CATTGAAACT CCGACGCTCA AGATCAAAGA	2040
	CTTGTTGGAC ATCTTCTTTA GTCATCTCTC TAATGTTTAA TTGTTCTTTT GACTGTTGAT	2100
40	CCAATTTTCT TCCGCCTCAG CTAATTTATG GTATTTAGGA GTAAATGTAT GTACGTCTGA	2160
	AGGTTTATCT AGCAATTGAT ACATGACTGA TGCATTTGGT AGctGCGCAA TCACTTCACC	2220
	TTGTAATTCA TCTTGTAATT TTACAGTATC TTTCCCAATA TAAATAAATG GTTGGTTTTAA	2280
45	ATCTTCTAAA AAAGCTCGCA ATGCCTCTAT CGACATATAT TGATCTTCTA AAATAGTCAC	2340
	TAATTGACCA TTTTGCCACT GGAATATGCC TGTATAAACT GCTTGTCGTC TTGCATCAAA	2400
	CACAGGAACC AATAATTTAT CAGTATGATC GATTGTTGCT GCCAATGCCT TTAATGATGA	2460
50	AACACCATAT AATTTAACAT CTAACGCATA CGCTAATGTT TTAGCAACAG TAACACCGAT	2520
	ACGTAAGCCA GTATATGAAC CAGGACCTTC AGCAACAATA ATCGCATCTA ATTGCTGTTT	2580

55

EP 0 786 519 A2

	TTGTTTAGAA TCCGTAGTTA TTTCAGCTAA AACTTCATCG TTTGTCATCA ATGCTACTGA	2700
	TAATGGTTGA TTCGATGTAT CAATGAGCAG CGAATTCATG GATAATTGCC TCCTTAATTT	2760
5	G TTCATAATG TTCTCCTTGC GCGAACAACT CAATTTGTCT TGTATTTTCA GATATTGTTG	2820
	AAATGTTAAT AGATAAATGC GTCGCTGGAA GTAAATCTTT TATAAATTGA CTCCATTCAA	2880
	TAACAGTAAT TGCCTGATCT TCGAAAAATT CATCAAATCC TAAATCTTCA TCAGAATCTT	2940
10	CTAAGCGATA ACAATCCATA TGATGCAATT TTAAATTTTT ACCCCTATAT GATTTAATGA	3000
	TGTTAAATGT CGGGGAATTA ATCGTACGTC TTACACCAAG AGCTTTTCCT ATAAATTGCG	3060
15	TTAACGTTGT TTTACCTGCT CCTAAATCTC CGTTAAGTAA AATCAAATCA CCACTTTTCA	3120
	ATTGCTCAAC TAAAAATATA GCAAATTGAT TCATTTTCATC TAAATTATTT ATCTTTATCA	3180
	ATGTTGATTC TCCTATATTA TGCTTTTCAT TCATAAAAAT GATTATCCAT TGTTCATCG	3240
20	TATCTAACTT TATATTAAAC CTTTATATTG TAACAAATTT CAACTTAAAT TTCTTATCTT	3300
	TGAAACAGAT TATCTATTCA AAGTTAATTG TAAGAAAATT TAAAATATTT GTTGACATAC	3360
	TAAAGCAGAT ATAGTAAATT AAATTTATCA AATTTTTAGA CAATTCTAAC TATTAAAGTG	3420
25	ATATATACCA TTCACGGAAG GAGTATAATA AAATGCTTAA TCAATATACT GAACATCAAC	3480
	CGACAAC TTC AATATTATT ATTTTATTAT ACTCTTTAGG ACTCGAACGT TAGTAAATAT	3540
	TTACTAAACG CTTTAAGTCC TATTTCTGTT TGAATGGGAC TTGTAAACGT CCCAATAATA	3600
30	TTGGGACGTT TTTTATGTT TTATCTTTCA ATTACTTATT TTTATTACTA TAAAACATGA	3660
	TTAATCATTA AAATTTACGG GGGAATTTAC TATGCGAaCG AgcATGATCA AAAAAGGAGA	3720
35	TCACCAAGCA CCAGCAAGAA GTCTTTTACA TGCCACGGGC GCGCTAAAAA GTCCAAC TGA	3780
	TATGAACAAA CCATTTGTAG CTATTTGTAA CTCTTATATT GATATTGTTT CTGGACATGT	3840
	TCAC TTGAGA GAGCTTG CAG ATATAGCTAA AGAAGCAATT AGAGAAGCCG GTGCCATTCC	3900
40	ATTTGAATTC AATACAATTG GTGTTGATGA TGAATAGCT ATGGGACATA TCGGAATGCG	3960
	ATATTCTCTA CCATCACGTG AAATTATTGC AGATGCAGCT GAACTGTAA TTAACGCTCA	4020
	TTGGTTTGAC GCGGTATTTT ACATTCCTAA TTGTGACAAG ATTACACCCG GTATGATTTT	4080
45	AGCAGCCATG AGGACAAACG TACCAGCTAT CTTTGTCTCT GGTGGACCAA TGAAAGCTGG	4140
	CTTATCTGCA CATGGAAAAG CATTAACACT TTCATCAATG TTTGAAGCAG TCGGCGCATT	4200
	TAAAGAAGGA TCGATTTCTA AAGAAGAATT TTTAGATATG GAACAAAATG CCTGCCCTAC	4260
50	TTGTGGTTCA TGTGCTGGGA TGTTTACTGC AAATTCAATG AACTGTTTGA TGGAAGTTTT	4320
	AGGTCTAGCA TTACCATACA ACGGTACTGC ACTTGCAGTC AGTGATCAGC GACGAGAAAT	4380

55

EP 0 786 519 A2

	TATCGTTACT	CGCGAAgCAA	TTGATGATGC	ATTTGCACTT	GATATGGCTA	TGGGTGGTTC	4500
	AACAAACACG	GTA CTGCATA	CGTTAGCCAT	TGCCAATGAA	GCTGGTATTG	ATTATGACTT	4560
5	AGAGCGCATT	AATGCTATTG	CCAAACGCAC	GCCATATTTA	TCAAAAATAG	CACCTAGTTC	4620
	ATCGTATTCA	ATGCATGATG	TGCATGAAGC	TGGTGGCGTC	CCAGCAATTA	TTAATGAATT	4680
	GATGAAGAAA	GATGGCACGT	TACACCCAGA	TAGAATCACA	GTTACTGGCA	AAACGTTACG	4740
10	TGAAAATAAC	GAAGGCAAAG	AAATTAAGAA	CTTTGATGTC	ATTCACCCTC	TTGATGCACC	4800
	ATATGATGCA	CAAGGCGGTT	TATCTATCTT	ATTTGGTAAT	ATCGCCCCTA	AAGGCGCAGT	4860
15	TATTAAAGTT	GGCGGCGTTG	ATCCATCTAT	CAAAACATTT	ACTGGGAAAG	CAATTTGTTT	4920
	CAATTCGCAT	GATGAAGCTG	TTGAAGCAAT	AGACAATCGT	ACCGTTCGTG	CAGGCCACGT	4980
	CGTTGTCATT	AGATATGAAG	GACCTAAAGG	TGGACCAGGT	ATGCCTGAAA	TGTTAGCACC	5040
20	TACTTCCTCT	ATTGTTGGTC	GCGGCTTAGG	TAAAGATGTT	GCATTAATTA	CTGATGGGCG	5100
	TTTTTCCGGT	GCCACAAGAG	GTATTGCAGT	TGGTCATATT	TCCCCTGAAG	CTGCATCTGG	5160
	TGGACCAATT	GCCTTAATTG	AAGATGGTGA	TGAGATTACT	ATTGATTTAA	CAAATCGTAC	5220
25	ATTAAACGTA	AACCAGCCTG	AAGATGTTCT	AGCGCGTCGC	CGAGAATCTT	TAACACCATT	5280
	TAAAGCGAAA	GTA AAAACAG	GTTATCTAGC	TCGTTATACT	GCCCTAGTAA	CTAGCGCAAA	5340
	TACAGGTGGC	GTCATGCAAG	TCCCTGAGAA	TTTAATTTAA	TTTATTTTTA	TATTGGAGAT	5400
30	GGTTAAAATG	TCTAAAACTC	AACATGAAGT	AAACCAAAT	ATTGACCCTT	TAAAAATGGC	5460
	TGAATCACTT	GAACCTGAAC	AACTAAATGA	AAAACTTTA	AATGATATGC	G TTCAGGATC	5520
35	AGAAGTGCTA	G TAGAAGCTC	TACTTAAAGA	AAATGTGGAT	TATTTATTCTG	GTTATCCTGG	5580
	TGGTGCCGTA	CTACCTTTAT	ATGACACGTT	TTATGATGGT	AAAATCAAAC	ATATTTTAGC	5640
	AAGA CACGAA	CAAGGTGCTG	TTCATGCTGC	AGAAGGTAT	GCACGTGTAT	CTGGTAAamT	5700
40	GGCGTCGTTG	TAGTTACAAG	CGGTCCaGGT	GCAACTAATG	TAATGACAGG	TATTACGGAT	5760
	GCACATTGCG	ACTCTTTACC	TCTAGTTGTA	T TCACTGGAC	AAGTTGCTAC	ACCAGGCATT	5820
	GGTAAAGATG	CATTCCAAGA	AGCGGATATT	CTATCTATGA	CTTCACCAAT	TACAAAACAA	5880
45	AATTATCAAG	TGAAACGTGT	TGAAGATATC	CCTAAAATCG	TACACGAAGC	TTTCCATGTA	5940
	GCTAATTCTG	GACGCAAAGG	TCCTGTAGTG	ATTGATTTTC	CAAAAGATAT	GGGTGTTTTA	6000
	GCTACAAATG	TGGATTTATG	CGACGAAATC	AATATTCCAG	GTTATGAAGT	TGTTACAGAA	6060
50	CCAGAAAATA	AAGACATTGA	CACTTTCATC	TCACTTTTAA	AAGAAGCGAA	AAAGCCTGTC	6120
	GTATTAGCCG	GCGCAGGTAT	TAATCAATCA	AAATCAAATC	AATTATTAAC	ACAGTTTGTT	6180
55							

	GATACACTAT TTTTAGGTAT GGGAGGAATG CATGGTTCTT ATGCTAGTAA CATGGCATT	6300
	ACTGAGTGTG ATTTACTCAT TAATTTAGGT AGCCGCTTCG ATGATAGATT AGCAAGCAAA	6360
5	CCTGATGCCT TTGCACCTAA CGCCAAAATT GTACATGTAG ATATTGATCC TTCAGAAATC	6420
	AATAAAGTTA TTCATGTAGA TTTAGGTATT ATTGCAGACT GTAAAAGATT TTTAGAATGT	6480
10	TTAAATGATA AAAATGTTGA GACTATAGAA CACAGTGACT GGGTTAAACA TTGTCAAAAT	6540
	AATAAGCAGA AACACCCATT TAAACTTGGT GAAGAAGATC AAGTATTTTG TAAGCCACAA	6600
	CAACAATCG AATATATCGG CAAAATTACA AATGGTGAAG CAATTGTTAC TACAGACGTG	6660
15	GGACAACATC AAATGTGGGC AGCTCAATTT TATCCATTTA AAAATCACGG ACAATGGGTT	6720
	ACAAGCGGTG GTTTAGGAAC AATGGGATTC GGTATTCCTT CGTCAATTGG TGCCAAATTA	6780
	GCTAATCCTG ATAAAACAGT CGTATGTTTC GTCGGTGACG GTGGTTTCCA AATGACAAAC	6840
20	CAAGAAATGG CACTTTTACC CGAATATGGT TTAGATGTCA AAATCGTACT AATCAATAAT	6900
	GGAACATTAG GTATGGTTAA ACAATGGCAA GATAAGTTCT TTAATCAACG CTTCTCACAC	6960
	TCAGTATTTA ATGGTCAACC TGATTTTATG AAAATGGCAG AAGCATATGG CGTCAAAGGT	7020
25	TTCTTAATCG ATAAGCCAGA ACAACTGGAA GAACAATTAG ATGCAGCGTT TGCTTATCAA	7080
	GGACCAGCTT TAATTGAGGT TCGTATTTCC CTTACTGAAG CTGTAACCCC AATGGTTCCG	7140
	AGTGGCAAAT CAAATCATGA AATGGAGGGC TTATAATGAC AAGAATTCTT AAATTACAAG	7200
30	TTGCGGATCA AGTCAGCAGC CTAAATCGAA TTACAAGTGC TTTTGTTTCG CTACAATATA	7260
	ATATCGATAC ATTACATGTT ACACATTCTG AACAACTGG GATTTCTAAC ATGGAAATTC	7320
	AAGTCGATAT TCAAGATGAT ACATCACTTC ATATATTAAT TAAAAAATTA AAACAACAAA	7380
35	TTAATGTTTT AACGGTTGAA TGCTACGACC TTGTTGATAA CGAAGCTTAA TTTTAAGACA	7440
	AAGGCAATGA TGCGCTAATT AGTTATAGAT ATATCATAGG CTGCTAGTTA ACATCTGCCA	7500
40	CTATTACAAA GTTATATTTT AGAATTTTCG AAACACAAA TATTTAATTA TTTGGAGGAA	7560
	TTTATTATGA CAACAGTTTA TTATGATCAA GATGTAAAA CGGACGCTTT ACAAGGCAAA	7620
	AAAATTGCAG TAGTAGGTTA TGGATCACAA GGTCACGCGC ATGCACAAAA CTTAAAAGAC	7680
45	AATGGATATG ATGTAGTCAT CGGCATTTCG CCAGGTCGTT CTTTTGACAA AGCTAAAGAA	7740
	GATGGATTTG ATGTGTTCCC TGTTGCAGAA GCAGTTAAGC AAGCTGATGT AATTATGGTG	7800
	CTATTACCTG ATGAAATTCA AGGTGATGTA TACAAAAACG AAATTGAACC AAATTTAGAA	7860
50	AAACATAATG CGCTTGCATT TGCTCATGGC TTTAACATTC ATTTTGGTGT TATTCAACCA	7920
	CCAGCTGATG TTGATGTATT TTTAGTAGCT CCTAAAGGAC CGGGTCATTT AGTTAGACGT	7980

55

	CAAGCACGTA ATATTGCTTT AAGTTATGCA AAAGGTATTG GTGCAaCTCG TGCAGGTGTT	8100
	ATTGAAACAA CATTTAAGA AGAACTGAG ACAGATTTAT TTGGTGAACA AGCAGTACTT	8160
5	TGCGGTGGTG TATCGAAATT AATTCAAAGT GGCTTTGAAA CATTAGTAGA AGCGGGTTAT	8220
	CAACCAGAAT TAGCTTATTT TGAAGTATTA CATGAAATGA AATTAATCGT TGATTTGATG	8280
	TATGAAGGCG GTATGAAAA TGTACGTTAC TCAATTTCAA ATACTGCTGA ATTTGGTGAC	8340
10	TATGTTTCAG GACCACGTGT TATCACACCA GATGTTAAAG AAAATATGAA AGCTGTATTA	8400
	ACTGATATCC AAAATGGTAA CTTCAGTAAT CGCTTTATCG AAGACAATAA AAATGGATTC	8460
15	AAAGAATTTT ATAAATTACG CGAAGAACAA CATGGTCATC AAATTGAAAA AGTTGGTCGT	8520
	GAATTACGCG AAATGATGCC TTTTATTAAA TCTAAAAGCA TTGAAAAATA AGATAGACCT	8580
	ACAATGAGGA GTTGTTAAAT ATGAGTAGTC ATATTCAAAT TTTTGATACG AACTAAGAG	8640
20	ACGGTGaACA AACACCAGGA GTGAATTTTA CTTTGTATGA ACGCTTGCGT ATTGCATTGC	8700
	AATTAGAAAA ATGGGGTGTA GATGTTATTG AAGCTGGATT TCCTGCTTCA AGTACAGGTA	8760
	GCTTTAAATC TGTTCAAGCA ATTGCACAAA CATTAAAC AACGGCTGTA TGTGGTTTAg	8820
25	CTAGATGTAA AAAATCTGAC ATCGATGCTG TATATGAAGC AACAAAAGAT GCAGCGAAgC	8880
	CGGTcGTGCA TGTTTTTATA GCAACATCAC CTATTCATCT TGAACATAAA CTTAAAATGT	8940
	CTCAAGAAGA CGTTTTAGCA TCTATTAAAG AACATGTCAC ATACGCGAAA CAATTATTTG	9000
30	ACGTTGTTCa ATTTTCACCT GAAGATGCAA CGCGTACTGA ATTACCATTc TTAGTGAAAT	9060
	GTGTACAAAC TGCCGTTGAC GCTGGAGCTA CAGTTATTAA TATTCCTGAT ACAGTCGGCT	9120
35	ACAGTTACCA TGATGAATAT GCACATATTT TCAAAACCTT AACAGAATCT GTAACATCTT	9180
	CAAATGAAAT TATTTATAGT GCTCATTGCC ATGACGATTT AGGAATGGCT GTTTCAAATA	9240
	GTTTAgCTGC AATTGAAGGC GGTGCGAGAC GAATTGAAGG CACTGTAAAT GGTATTGGTG	9300
40	AACGAGCAGG TAATGCAGCA CTTGAAGAAG TCGCGCTTGC ACTATACGTT CGAAATGATC	9360
	ATTATGGTGC TCAAACGCT CTTAATCTCG AAGAACTAA AAAACATCG GATTTAATTT	9420
	CAAGATATGC AGGTATTCGA GTGCCTAGAA ATAAAGCAAT TGTTGGCCAA AATGCATTTA	9480
45	GTCATGAATC AGGTATTCAC CAAGATGGCG TATTAACAAC TCGTGAAACA TATGAAATTA	9540
	TGACACCTCA ACTTGTTGGT GTAAGCACGA CTGAACTTCC ATTAGGAAAA TTATCTGGTA	9600
	AACACGCCCTT CTCAGAGAAG TTAAAAGCAT TAGGTTATGA CATTGATAAA GAAGCGCAAA	9660
50	TAGATTTATT TAAACAATTC AAGGCCATTG CGGACAAAA GAAATCTGTT TCAGATAGAG	9720
	ATATTCATGC GATTATTCAA GGTCTGAGC ATGAGCATCA AGCACTTTAT AAATTGAAAA	9780
55		

	AAGAGGGTCA TATTTACCAG GATTCAAGTA TTGGTACTGG TTCAATCGTA GCAATTTACA	9900
	ATGCAGTTGA TCGTATTTTC CAGAAAGAAA CAGAATTAAT TGATTATCGT ATTAATTCTG	9960
5	TCACTGAAGG TACTGATGCC CAAGCAGAAG TACATGTAAA TTTATTGATT GAAGGTAAGA	10020
	CTGTCAATGG CTTTGGTATT GATCATGATA TTTTACAAGC CTCTTGTAAG GCATACGTAG	10080
	AAGCACATGC TAAATTTGCA GCTGAAAATG TTGAGAAGGT AGGTAATTAA TTATGACTTA	10140
10	TAACATTGTT GCCCTACCTG GTGATGGAAT CGGTCCAGAA ATTTTGAACG GATCTCTATC	10200
	ATTGCTTGAA ATTATAAGTA ATAAATATAA CTTTAATTAT CAAATAGAGC ACCACGAATT	10260
15	TGGTGGTGCC TCTATTGATA CATTCCGGCGA GCCTTTAACT GAGAAAACCT TAAATGCGTG	10320
	TAAAAGAGCA GATGCTATTT TACTGGGTGC AATCGGTGGA CCTAAATGGA CAGATCCTAA	10380
	CAATCGACCA GAACAAGGAT TATTTAAATTT GCGTAAATCC TTAAATTTAT TTGTAAATAT	10440
20	ACGCCCCACT ACCGTTGTCA AAGGCGCTAG TTCTTTATCA CCTTTAAAGG AAGAACGCGT	10500
	TGAAGGCACA GATTTAGTTA TAGTCCGTGA ATTGACAAGT GGTATTTTAT TTGGAGAACC	10560
	TAGACATTTT AATAATCACG AGGCCTTAGA TTCTCTTACT TATACAAGAG AAGAAATAGA	10620
25	ACGCATTGTT CACGTAGCAT TTAAATTGGC CGCTTCAAGA CGAGGAAAAC TAACATCAGT	10680
	TGATAAAGAA AATGTATTAG CTCTAGTAA ATTGTGGCGC AAAGTCGTAA ATGAAGTAAG	10740
	TCAATTATAT CCAGAAGTAA CAGTAAATCA CTTATTTGTT GATGCTTGTA GTATGCATTT	10800
30	AATCACAAAT CCAAAACAAT TTGACGTCAT CGTATGTGAA AACTTATTTG GCGATATTTT	10860
	AAGTGATGAA GCTTCAGTGA TTCCTGGTTC ACTTGGTTTA TCACCTTCG CTAGTTTTAG	10920
	TAACGATGGT CCAAGATTGT ATGAGCCTAT TCATGGATCA GCACCAGATA TTGCAGGTAA	10980
35	AAACGTTGCC AATCCATTTG GAATGATTCT ATCTTTAGCG ATGTGTTTAC GTGAAAGCTT	11040
	AAATCAACCA GATGCTGCAG ATGAATTAGA ACAACATATT TATAGCATGA TTGAACATGG	11100
40	GCAAACGACA GCAGATTTAG GCGGCAAATT GAATACTACT GATATTTTCG AAATTCTATC	11160
	TCAAAAATTG AATCACTAAG GGGGAGATGT AAATGGGTCA AACATTATTT GACAAGGTGT	11220
	GGAACAGACA TGTGTTATAC GGGAAATTGG GCGAACCGCA ACTATTATAC ATTGATTTAC	11280
45	ACCTTATACA TGAAGTTACT TCTCCTCAAG CATTTGAAGG ACTTAGGCTT CAAAACAGAA	11340
	AATTAAGACG CCCAGATTTA ACATTTGCAA CACTCGATCA CAATGTTTCT ACTATTGATA	11400
	TATTCAATAT TAAAGATGAA ATTGCAAACA AACAAATCAC AACATTACAA AAAAACGCCA	11460
50	TAGATTTTGG GGTGCATATT TTTGATATGG GTTCTGATGA ACAAGGTATT GTTCACATGG	11520
	TAGGACCTGA GACAGGACTT ACACAGCCTG GCAAGACAAT CGTTTGTGGT GACTCTCACA	11580

55

	ATGTTTTTCGC AACTCAAACG CTATGGCAAA CAAAACCCAA AAACCTAAAA ATCGATATTA	11700
	ATGGTACCTT ACCAACAGGC GTCTATGCTA AGGACATTAT TCTGCATTTA ATTAAAACGT	11760
5	ATGGTGTGA CTTTGGTACA GGCTATGCTT TGGAATTTAC TGGCGAAACA ATTAAAAACC	11820
	TTTCAATGGA TGGTCGAATG ACTATTTGTA ACATGGCTAT CGAAGGTGGT GCCAAATACG	11880
	GCATAATCCA ACCTGATGAT ATAACATTTG AATATGTTAA AGGGAGACCA TTTGCCGATA	11940
10	ACTTCGCTAA ATCAGTTGAT AAGTGGCGTG AGCTATATTC TGATGACGAC GCGATATTTG	12000
	ATCGTGTAAT TGAAC TTGAT GTTTCAACAT TAGAACCACA AGTGACATGG GGAAC TAATC	12060
	CTGAAATGGG TGTTAATTTT AGTGAACCAT TCCCTGAAAT CAATGATATC AACGATCAAC	12120
15	GTGCGTATGA TTATATGGGG TTAGAACCAG GTCAAAAAGC TGAAGACATC GACTTAGGGT	12180
	ATGTTTTTCT CGGTTTCATGT ACAAATGCTA GACTATCAGA TTTGATTGAA GCTAGTCATA	12240
20	TTGTTAAAGG AAATAAAGTT CATCCAAATA TTACAGCTAT TGTCGTACCA GGTTCCTGTA	12300
	CAGTAAAAAA AGAAGCAGAA AAATTAGGTC TAGATACTAT CTTTAAAAAT GCAGGATTTG	12360
	AATGGCGTGA ACCAGGATGT TCAATGTGTT TAGGCATGAA TCCTGACCAA GTACCTGAGG	12420
25	GCGTACATTG TGCATCTACA AGTAATCGAA ACTTTGAAGG ACGACAAGGC AAAGGTGCAA	12480
	GAACACATTT AGTATCCCCT GCTATGGCAG CAGCAGCAGC TATTCATGGT AAATTTGTGG	12540
	ACGTAAGAAA GGTGGTTGTT TAAATGGCAG CAATCAAACC TATTACAACA TATAAAGGTA	12600
30	AAATAGTCCC TCTCTTCAAC GACAATATCG ATACAGACCA AATCATTCCT AAGGTACACT	12660
	TAAAGCGTAT TTCAAAAAGT GGCTTTGGTC CATTTGCTTT TGATGAATGG CGGTACTTAC	12720
	CTGATGGTTC AGATAATCCT GATTTCAATC CTAACAAACC ACAATATAAA GGGGCTTCTA	12780
35	TTTTAATTAC TGGAGATAAT TTTGGATGTG GTTCAAGTCG TGAACATGCT GCTTGGGCTC	12840
	TTAAGGACTA TGGTTTTTCAT ATTATTATTG CAGGAAGTTT CAGTGACATA TTTTATATGA	12900
40	ATTGCACTAA AAATGCGATG TTGCCTATCG TTTTAGAAAA AAGTGCCCGT GAACATCTTG	12960
	CACAAATATGT TGAAATTGAG GTCGATTTAC CAAATCAAAC TGTGTCATCA CCAGACAAGC	13020
	GTTTCCATTT TGAAATTGAT GAAACTTGGA AGAATAAACT TGTAATATGGC TTAGATGACA	13080
45	TTGCAATCAC CCTACAATAT GAATCATTA TAGAAAAATA TGAAAAATCa CTTTAAGGGA	13140
	GTTGAATATT ATGACAGTCA AAACAACAGT TTCTACGAAA GATATCGATG AGGCATTTTTT	13200
	AAGACTTAAA GATATTGTCA AAGAAACACC TTTACAATTA GACCATTACT TATCTCAAAA	13260
50	GTATGATTGT AAAGTCTATT TAAAACGAGA AGATTTACAA TGGGTACGTT CTTTTAAATT	13320
	AAGAGGTGCT TACAACGCTA TTTCTGTTTT ATCAGATGAA GCTAAAAGTA AAGGTATTAC	13380

55

EP 0 786 519 A2

	AAACGCTGTT ATCTTTATGC CAGTCACTAC ACCTTTACAA AAGGTAAATC AAGTAAAGTT	13500
	CTTTGGAAAT AGTAACGTTG AAGTTGTA CTCTGGTGAT ACATTTGATC ACTGTTTAGC	13560
5	TGAAGCTTTA ACTTATACAA GTGAACATCA AATGAACTTT ATAGATCCAT TCAATAATGT	13620
	TCATACAATT TCTGGACAAG GTACGCTTGC TAAAGAAATG CTAGAACAAG CAAAGTCTGA	13680
	CAATGTTAAC TTTGATTATC TATTTGCCGC AATTGGTGGT GGCGGTTTAA TTTCAGGTAT	13740
10	TAGTACTTAC TTTAAAACCT ATTCACCTAC CACGAAAATT ATAGGTGTG AACCTTCAGG	13800
	TGCAAGTAGT ATGTATGAAT CTGTTGTGGT AAATAATCAG GTAGTCACAT TGCCTAATAT	13860
	CGATAAATTT GTGGACGGTG CATCTGTAGC TAGAGTTGGC GATATTACAT TTGAAATTGC	13920
15	AAAAGAAAAT GTAGATGATT ACGTTCAAGT AGATGAAGGT GCAGTTTGTT CTACGATTTT	13980
	AGATATGTAT TCAAAACAAG CAATTGTAGC AGAACCTGCT GGCGCATTAA GTGTAAGTGC	14040
20	GCTTGAAAC TATAAAGATC ATATTAAAGG TAAACAGTG GTTTGTGTCA TTAGTGGTGG	14100
	TAATAATGAT ATTAATCGAA TGAAAGAAAT TGAAGAAGT TCATTACTAT ACGAAGAAAT	14160
	GAAGCATTAC TTTATCTTAA ATTTCCCTCA ACGTCCAGGT GCATTGAGAG AATTGTAAA	14220
25	TGACGTATTA GGACCTCAAG ACGATATTAC TAAATTTGAA TACTTAAAAA AATCTTCTCA	14280
	AAATACAGGT ACTGTCATTA TTGGTATTCA ACTTAAAGAT CATGATGATT TAATACAAC	14340
	CAAACAACGT GTAAATCATT TCGATCCTTC CAATATTTAT ATTAATGAAA ATAAGATGTT	14400
30	ATATTCATTG TTAATTTAAC ACATAGTAAG AAAACAGTC ATAAATTGAT TTCTAATTGA	14460
	AATCATCTTA TGACTGCTTT TTATTATACT TTACATTTCT CGTTTCGTCA GATTCAAACG	14520
	TTTCACTTC GCCAAGCCAT CTTTCTTTGT GTTTGCTTTT aTTTTGACGT TTTAGACATA	14580
35	AAAAAaGAGA CCTTGCGGTC TCAATGCGGC TCATCGCATC CACTTTTTGC CTGGCAACGT	14640
	TCTACTCTAG CGGAACGTAA GTTCGaCTAC CATCGACGCT AAGGAGCTTA ACTTCTGTGT	14700
40	TCGGCATGGG AACAGGTGTG ACCTCCTTGC TATAGTCACC AGACATATGA ATGTAATTTA	14760
	TACATTCAAA ACTAGATAGT AAGTAAAAGT GATTTTGCTT CGCAAACAT TTATTTTGAT	14820
	TAAGTCTTCG ATCGATTAGT ATTCGTCAGC TCCACATGTC ACCATGCTTC CACCTCGAAC	14880
45	CTATTAACCT CATCATCTTT GAGGGATCTT ATAACCGAAG TTGGGAAATC TCATCTTGAG	14940
	GGGGGCTTCA TGCTTAGATG CTTTCAGCAC TTATCCCGTC CACACATAGC TACCCAGCTA	15000
	TGCCGTTGGC ACGACAACGT GTACACCAGA GGTATGTCCA TCCCGGTCCT CTCGTACTAA	15060
50	GGACAGCTCC TCTCAAATTT CCTACGCCCA CGACGGATAG GGACCGAACT GTCTCACGAC	15120
	GTCTGAACC CAGCTCGCGT ACCGCTTTa TGGGCGAACA GCCCAACCCT TGGGACCGAC	15180

55

GTGGAACTT

15249

(2) INFORMATION FOR SEQ ID NO: 103:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 14051 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 103:

15	GTGGCAATAT TTCTAGTTCT CGTTTTGATA AGATTTTAAA AGGATCTGTT GTGTTTGCAG	60
	TGTCCTGATT TGAATTAGAT ACAAATTCAT TCACTAAAGA TGTTGTAAGT TTCATATCTA	120
	CATATGTTTC ACCTTTATAT ACAGTTCGAA TAGCTAACAA TAATTGTTCA TCAGGTGCAT	180
20	TTTTC AATAT GTAACCTTTC GCACCATTAC GCAACACATG GAACAAATAC TCCTCATCAT	240
	CAAACATTGT TAATATTAGT ATTTTAGTTT CAGGAAACT GTCAGCAATT TTACTCGTAG	300
	CGATAAGACC TGACTCACCT GGTGGcATAC TTAAATCCAT TAGTAACACA TCAGGTTTAT	360
25	ATTCCATTAC TTTTGGTAA GCTTCGACGC CATCTGCAGC CGTTGCAACA ACTTCCATAT	420
	CATTTTGATA ATTTAAAATC ATAGAGAACC CCGTACGGAC AACAGCGTGA TCATCGGCAA	480
	TGACTATTTT CAATTTTATT CCCCCAATGT ATGTTTCAAA TTGGAATGTT CAATGTAACA	540
30	TTGGTACCCT CACCAATTTT CGTTTCAATA TTGACGCTAC CGCTGACTAA CTCAGCTCGC	600
	TCATTCATT C CATATAAACC GAGTCCAGAA CCTTTAGGCT TAGAACTTGG ATCAAAACCA	660
	TTCCCCGCAT CTATCACTTC TGCTACCAAA TGGCGCCCAG TTTGACGGAT ACCTACATTT	720
35	ATTTCAATTTA CATCAGCGTA TTTCAACGCA TTTAAAATAG CTTCTTGCAC TACTCGATAA	780
	ACAACCGTTT CAATATCACT ATCAAAGCGA GTATTTTAA TATTTGATGT ATATATGATT	840
40	TTTATTCCAT AATTTTCTTC AAAGTGTTA AAATATGATT TAAAAGCTGC TTCAAGGCCT	900
	AGATCATCCA AAGAAGCGGG TCTTAATTCA ACCGACATAT TACGTATATC ATCAATTAAT	960
	TTAGCGACAA TATATTCAAT ATTTTCTGCG TCTTCCAAAA GCTTAGTTGT ATCTTCTTGA	1020
45	TATTTTAATA ATCTCAATTG AACATCTACA TTGAGCATTT CTTGAATCAC ACTATCATGT	1080
	AACTCTCTAG AAATTCGCTT TCTTTCATTT TCTTGGGCTG AGATTGTTTT ACGCATCATA	1140
	CGTTGTTGAT GCAATTTCTC TTGCTGTTCA ATTTGTGATG AAACATTTTG AAGCGTAAAT	1200
50	GCATGAATTC CCCTGTCTTG ATCAATCAAC TGATATGTTG CTGTAAATGG CATCACTTTT	1260
	TGATCTTTTC TCTTCATAAA TACTTGAAAA TTCGTAGCTT GTACTTGCAT CGATTCTAAG	1320

EP 0 786 519 A2

	ATCGCATTCTG CCACAGCACT GTAATTATCT TCTTCAGATA ATATATCTTT AGCAGCATCA	1440
	TTCATTGCAA TAATTTTACC GTTATCATCA GCAAAACTA TCTTTTCGAT TGAATGCTCA	1500
5	TAATATTTTT TCAATAAAGT ATCTAACTGT ATACTGTCCT CATTAATCAT GACTTACACC	1560
	CTAATTCATC TCATTATTTA TCATCATTGA AAATACCAAA CTTACGTTGA ATATCATCAT	1620
	TATCAAATAT TTTTGGTAAA GGACGACCAT CTCTTTGACC AAATAATAGT ACGCCATACA	1680
10	CTTGATTCTT ATACCAAAGC GGCCTGCTA AAAGTCTGT TAATGATTCTG CTCAATAAAA	1740
	TTGGATAGTC AATCTTTTCT TCAGGCCCTA AAGCTAAACC AACATTGGCT ATTACCATAC	1800
	GCTTTCCTGT TTTCATAACA GTTCCAGCTA ATCCACGACC TTTTCTTAAA ATAATCAATT	1860
15	TAAATCGATT ATTTTTATTA CCTGAAACAT AGTGCCATTT TATTGGAGAT GATGGTTTGT	1920
	TAGATTCTTA GAAAGCGATT GCCGCAAAAT CATAACCTC TTCTTTGCGT ATTTTATCTA	1980
20	ATGTCTCTTG AAATCTACGA TCTTCAATTA TTGCTTCTGG TGTCAAATCC TTTCACCTCT	2040
	TATGCTTACA CTTTATTCTT ACGGTAAATA ATATATCTGC GATTTATATA TGTCAAAGGT	2100
	ACACTCCAAA CATGCACCAA ACGTGTAAT GGCCAACAAG CCATAATAGT GAAACCTAAC	2160
25	AATATATGCA TTTTAAATGC AATCGGCACA CCACTCATCA ATGACGCATC TGGTTTTAAC	2220
	ATAAATAATT GTCTAAACCA AATTGATAAT GAAGTTCTGT AGTTAAAGTC TGGATGTTGT	2280
	ATATTTGTTA CTAATGTTGC GTAACATCCC ATAAATACGA TAAGTAATAA TAAGAAATTT	2340
30	ACAAATATAT CCGACGCTGA ACTTAATCTT CGAATACTTT TCGTAGTAAC ACGTCTCGCT	2400
	GTTAATAAAA ACATCCCTAT CAAAGTTATT ATACCAAAGA TGCTACCAAT ATAAACAGCG	2460
35	CCTATATGAT ATAAATGCTC AGACACACCC ACTGCATCCA TCCATGGTTT CGGTATTAAAC	2520
	AATCCAACCTA CGTGTCCAAA AAACACTGGA ATAATACCTA AGTGAAATAA TAAACTTCCC	2580
	CACATCAACC TTTTCTTTT TATTAATTCA CTAGATTTAG CTGTCCAAGA AAATTTATCA	2640
40	TAACGATAAC GTGCAATATG ACCTGCGACA AAGACAACCTA AACATAAATA CGGAAATATA	2700
	ACCCATAAAA ACTGATTAAG CATGATGTTT CACTCCTTTT GGTGATGTCA AACATAATTT	2760
	CAATGTTTTT CTAAGTGCTT GAATCACATA GGCATATGGA TTGTTATCTT CACCAAGTGC	2820
45	ATTCGCCATC ACATATGTTT CATCCTCAAT AATCATAATG ATTAATTGAA TATTCTCTTC	2880
	AGCTCTTGGA TCATTTGCCC ATTCTGCCAC TTGCAAAAAT TGAAGCATCA ACGGTAGATA	2940
	ATCAGAAAAGT TCATTATCTA CCATTTCTAG TCCAAACATT TCATATAATA CCTTTAATTT	3000
50	AGCTAACATT TGCCCACGTT CTTTTTGCCT ATCAAATTTG TTATACGTCA TATATAATGG	3060
	TGCTTTTTTC GTAAAATCAA ATGTATCTGT ATAAATCGCT TTGATTTCTG ATAATGAAAA	3120
55		

EP 0 786 519 A2

	TGTTTCTTCA AAAGTTTTTG GATGAAAAGT TAATTTTTCT GGAAAACATA ACTGTTGTGC	3240
	CATATATCCA AAACCTTCTT GATATTTTTT AAAATTATCG AAATTAATCA CGGAAAATCC	3300
5	CTCCATAGAA ATTCTCATTA TAAATTTCTT GACCAGTTTT CCCTGAACCT ACTGCAACGC	3360
	CACAGCCTTC ACAGTTATCT CCAAATGCT CGCCGCCGTA ATTGTATCCT GTACTACCTT	3420
10	GTGCGTGATA CGTATCTAAA TAGGTTTCTT TGTGTGATGT TGGAATAACA AATCGATCTT	3480
	CATATTGGC TAGTCCTAAT AAACGATACA TGTCTTTAGT TTGGCGCTCG GTTATACCTA	3540
	ATCGCTCTAA TCGAGACGTG TCAATGGCT GTTGAGTAAC TTGAGATCTC ATATAACTTC	3600
15	TCATCATTCG CATACTGTG AGGGCTCCTT TTAAGTGGCTC TGTATCTCCT GCAGTGAAAA	3660
	TATTAGCTAA GTATTCAATA GGTAAACGCA TTTCTTCAAT GGCTGGGAAA ATCGCATCTG	3720
	GATTTTGAGT TGTATTTTTA CCTTCAAAT AGCTCATAAT TGGGCTAAGT GGTGGGCAAT	3780
20	ACCAAACCAT CGGCATCGTT CTAAATTCAG GATGTAACGG AAATGCAAGT TTATATTCAA	3840
	TTGCTAACTT ATAAATTGGA GAGTTTTGTG CAGCTTCAAT CCAATCGTAA CCAATACCAT	3900
	CTTTTTCAGC TTGAGCAATG ACTTCTTCGT CAAATGGGTT TAAGAATATA TCTAATTGTT	3960
25	TTTCATATAA ATCTTTCTCG TCTACTGCTG AAGCTGCTTC ATGAACTCGA TCTGCATCAT	4020
	ATAATAAAAC ACCTAAGTAA CGCATACGTC CTGTACAAGT TTCAGAGCAT ACCGTAGGCA	4080
30	TACCCGCCTC GATTCTCGGG AAACAGAAAG TACACTTTTC AGCTTTGTTC GTTTTCCAAT	4140
	TGAAGTAAAC TTTCTTATAT GGACAACCTG TCATACAGTA ACGCCATCCA CGACATGCGT	4200
	CTTGGTCAAC TAATACAATG CCATCTTCAT CACGTTTATA CATAGCACCT GAAGGACACG	4260
35	ATGCAACGCA ACTTGGATTC AAGCAATGTT CACATAAAGC TGGTAAATAC ATCATAAAAG	4320
	TTTCGTCAAA TTGGAATTTA ATATCTTCTT CTATTTTTTG GATGTTAGGA TCTTTTGGAC	4380
	CTGTAAACATG ACCACCTGCT AAGTCATCTT CCCAGTTAGG TCCCCATTCA ATTTCAATGT	4440
40	TATCCCCCGT AATTTCTGAA TACGCTCTAG CAACTGGCGA ATGCTTCCCT GATTTCGCAG	4500
	TTGTTAAATG TTCATAATTA TAGTTCCATG GCTCATAATA ATCTTTAATT AATGGCATAT	4560
	CTGGGTATA AAAAATTTTA CCTAAAGCAA TTTTGTAAAT TCTACTTCCA GATTTTAATT	4620
45	CAAGTTTCCC TTTACGATT AGTACCCAAC CACCTTTGTA GTGTTCTTGG TCTTCCCAAC	4680
	GTTTCGGATA CCCTACACCT GGCTTCGTTT CTACGTGTGT GAACCACATG TACTCAGCAC	4740
	CTGGACGATT TGTCCaAGTG TTTTACATG TCACACTACA CGTATGGCAT CCTATGCATT	4800
50	TATCTAAATT TAATACCATC GCAACTTGCG CTTTAATCTT CAAGCCAATT AACCTCCTTC	4860
	ATCTTTCTAA CTGCTACATA TAAATCCCTT TGGTTCCCAA TTGGTCCATA ATAATTAAAG	4920

55

GGCGCGTTGT GTGAACCACC ACGTGTATCT GTAATTTCTG ACCCAGGCGT TTGAATATGT 5040
 TTATCTTG TG CATGATACAT AACATTGTA CCTTTAGGCA TACGATGCGA AATAACTGCT 5100
 5 CTTGCCGTTA CAACACCATT ACGGTTATAC ACTTCTAGCC AATCATTATC TTGGATATCG 5160
 TGTTTTTCAG CATCTTCATT TGATATCCAA ACCGTTGGAC CACCTCTAAA TAGTGTCAAC 5220
 ATATGCTTAT TATCTTGATA CATTGAGTGT ATATTCCATT TTCCATGAGG CGTTAAATAA 5280
 10 CGCagTACCA AAGCATCTGT ACCACCTTTA ATTTTCTTAT CTCTATTCCC AAATACCATT 5340
 GGCGGCAATG TCGGTTTATA TACTGGTAAG CTCTCCCCAA ATTGTTGGAA AACTTCGTGA 5400
 TCCACATAAT AACTTTGACG TCCTGTTAAT GTTCTAAAAG GTACTAGACG TTCTATATTC 5460
 15 GTTGTAAATG GTGAATATCG TCGACCTTGT TTATTTGAAC CTGGGAATAC TGCTGTGGT 5520
 ATTACTTCTC GTGGTTGTGA AGTTATATTT AAAAACGAAA TTTTCTCAGC AGCGCGTTCTG 5580
 20 CTAGAAATAT CTTTAAACGG CATTCCAGTT TGTTCTTCGA GATCTTCATA TGATTTTTGT 5640
 GATAATTTAC CATTTCGTAGC AGATGAAATA CTTAGTATTG CATCAGCTAC ATTACGTGCT 5700
 GTATCAATAC GTGGACGATT CGCTCTCACA GAATCATCAT TTGTATCACT CCACGTACCT 5760
 25 AACATACTTT TTAATTCTTC ATATTGTTCA CTGACACCGA AACTTACACC ATGTGCTCCA 5820
 ACTTTCCTT TTTCAAGTAC AGGACCAAGC GTGACATATT TGTCGTAAAT TTTAGTGTAG 5880
 TCGCGTTCTA CAATTGCAA GTTAGGCATT GTACGTCCAG GTACCGCTTC AATTTACCCC 5940
 30 TTCGACCAAT CTTTCACTAC GCCGTATGGT GTTGAAATTT CTGCTTTGT ATCATGACTA 6000
 AGTGGAGTTG TCACAACATC TTTAAACGTT CCAGGTAAAT AGTCTTTTGC CATTTCTGAA 6060
 AATGCTTTTG CCAACGTTTT ATAAATATCC CAGTCTGAAC GCGATTCCCA TAACGGATCA 6120
 35 ATGGCAGGAT TGAAAGGATG TACATATGGA TGCATATCCG TTGATGATAA ATCATGTTTT 6180
 TCATACCAAG TCGCTGCCGG CAAACAATG TCAGAATATA ACGGTGTTGC CGTCATTCTG 6240
 AAGTCTAAAG AGACCACTAA ATCTAACTTA CCTGTTGTTT CTTACGCCA CGTAATTTCT 6300
 40 TCTGGCTTTT CATCTTCATT TGGTGTAGCT AATAACCCTG ATTTTGTGCC AAGTAAATGC 6360
 TTCATAAAGT ATTCTTGACC TTTGCAGAA CTGAAATTA AGTTTGAACG CCATATAAAT 6420
 45 AATGATTTTG GATGATTCTT TTTCAAATCA GGATCTTCTA TTGCAAATG TGTGTTTTT 6480
 GATTTCACTT CATCAATTGC ACGTTGCAA ATCGCTTCAT TTGAATCTAT ACCTTCATCT 6540
 TTAGCTTCTT CTGCAAACAA CAACTATTT TTATTAAATT GTGGATATGA TGGTAACCAA 6600
 50 CCAAGTCTAG CTGCTAAAAC ATTATAATCA GCTGGATGTT GATGCTTTAA CTCCTCTGTT 6660
 TTAGCTAATG GAGATTTTAA ACGATCTACA TTTGACTCTT CATATTTCCA TTGGTCTGTT 6720

55

EP 0 786 519 A2

AATGCGACAG TACTCCATCC TTCAATCGGA CGACATTTTT CTTGTCCCAC ATAGTGAGCC 6840
 CAACCGCCAC CATTACACACC TTGACAGCCA CATAACATAA CTAAGTTTAA GATTGAACGA 6900
 5 TAAATCGTAT CTGAGTTAAA CCAATGGTTA ATACCCGCAC CCATGATAAT CATTGAACGC 6960
 CCTTCAGTAT CGATAGCGTT TTGCGCAAAT TCTTTCGCTA CTTGAATGAC AACACTTTGT 7020
 TTTACGCCTG AAATGGCTTC TTGCCAAGCA GGTGTATATT TTGATTCTGC ATCGTCGTAT 7080
 10 CCTTTTGATT CTAATTTATG ATCAAAACGA CGCACGCCAT ATTGACTTGC CATTAAGTCA 7140
 AAAATTGTAG CAATACGGAC TTTGTCACCA TTTGCTAAAG TGACTTGTGC AGTTGGAATT 7200
 GGACGATTGA ATATCCCATC TCCATCACTA TCAAAGTATG GGAATTGAAT TGTTTCTAAT 7260
 15 TCGTATCCAC CTTCTGTCTG TGATAATGTA GGGTTAATTT TAGAACCATC TTCTGTTTCT 7320
 AGTTTAAAGT TCCACTTCTT ACCTTCTTCC CAACGTTGAC CCATTGTGCC ATTAGGTACT 7380
 ACTAAACTAT CGCTGATTGC ATCATGAATA ACTGGCTTCC ATTCGCCTTG CTCTGTTGTT 7440
 20 TGACCTAAGT CACTCGCTCT TAAAAATCGA CCCGCTTTAT ATCCATTTTC ATCTTCATCC 7500
 AGCATGATAA GAAACGGCAT ATCTGTATAT TGTTTAGCGT AATTTATAAA GCGTTCATTA 7560
 25 GGTGATTAA CATAATGTTT TTGTAAAATA ACATGCGTCA TTGCTTGTGC AATTGCAGCA 7620
 TCTGAACCAG GATTCGGTGC TAGCCAGTTA TCTGCAAATT TCACATTTTC TCGTAATCT 7680
 GGTGCTACTG AAATGACTTT TGTACCTTTA TAGCGGACTT CAGTCATAAA ATGTGCATCC 7740
 30 GGAGTACGTG TTAAAGGTAC ATTAGAGCCC CACATAATAA TGTATGATGC GTTATACCAG 7800
 TCACTTGATT CAGGCACATC TGTTTGCTCT CCCCAAATTT GTGGAGAGGC AGGTGGTAA 7860
 TCTGCATACC AGTCATAAAA ACTAAGCATT TCACCACCAA GCAAATTGAT GAATCGAGCA 7920
 35 CCTGCTGCAT AACTAATCAT TGACATCGCT GGAATAGGTG TAAATCCTGC GATTGATCT 7980
 GGACCATATT TTTTATTGT ATACAGTAAT TGTGCTGCGA TTATCTCTGT AACGCTTTTC 8040
 CAATTTGAAC GCACGTGCCC TCCCATACCT CGGCTTGCT TATATTGTTT GGCTTTGTCT 8100
 40 TCATTTTCAA CAATAGACGC CCATGCAGCA ACGCGATTAC CATTGTTTTT TTCTAATGCT 8160
 TCAGTCCATA AATCCCAGAG TTTTCCACGA ATATATGGAT ATTTGATTGC AAGCGGACTG 8220
 45 TATTCATACC AAGAGAATGA CGCACCTCGT GGACATCCTC TCGGTTTATA TTCAGGCATA 8280
 TCCGGACCAC AACTTGGATA GTCAGTTTGT TGATTTTCCC AGGTAATCAC ACCATTTTTC 8340
 ACAATACTT TCCAAGAACA TGAGCCTGTA CAGTTAACAC CATGTGTTGT TCTTACTTCT 8400
 50 TTATCGTGGC TCCAACGTTT TCTGTACATT TTTTCCATT CTCTACTTTT ACTTTCTAGG 8460
 ATCGACCAAT TCCCATTAAA TTTTCTGTT GGCTTAAAGA AATTCAATCC AAATTTTCCC 8520

55

EP 0 786 519 A2

	TAAATGCCC AAGACTATTG CTTTAATTAG ATTGTACATT TTTTCACAAA CATAAAATAT	8640
	TAGGGAATCA CCTAATTACT TAAGGAATTT CCCTATCAAT AACGGGATTT CATTGAAATA	8700
5	ATACACAATC ATGTATGGTC ATGCTTATTG CCAATCTAAA TCGTTCAAAT TTGGCACAAC	8760
	GACAAATAAG GCTTCAACAC GAATATATTG TCTCGGTTGA AACCTTACTT ATTCATTTAT	8820
	TTTTTATAAA TTAGTGACAT AACACTGTAT TAGCATCTGC ACGATCGGTT GAAATATATG	8880
10	TTACATTTTC TTGCTGCTTA ATAAATGCAT CATAGTAATC ATATTGCGAC GAATGATATG	8940
	TGCCATTGCA TGTATCATTT GGGTTTAGCA AACAGCCATA ACCTTCGTCA TATAAATGTT	9000
	CACAGAGCAT AAGGGCGTCA TGTTTAGAAC CACTTACTAC ATAAAATTGC TTCATAGGAT	9060
15	CATATGATTT AGGAGTGTTT TCAGTATAAT CAACAACCTC CCCTATAATA CATATACCTG	9120
	GTTTCGCCTC AATTGAATAG TGTTGCAATT TTGAAATAAT ATTACTTAAA CGCCCCTTAA	9180
20	CAACAACTC GTTAAACAC GATGCTTGAA AGACAATCGC TATCGGGTAA TCAATATCTG	9240
	TGTATTGTTG TATCTGTGTG ATAATTTTCC CTAAACGTTT TACCCCATTA TAAATTGCTA	9300
	ACGTGCCACC ATTCACTAAG GAATTGACAT CCACTTCATT TTCTTCTGAA TCTTTAAAGT	9360
25	GACCTGTAGA AAATGTCACA CTTTGTAGCA CTGTACGCAT TGTCAAACCT GTCTGCATAG	9420
	TAGCAACTGC TGCGCTCGCT GATGTCACCC CTGGTACAAT TTCAAACGCA ATATGATGTT	9480
	CATTTAGTAT GTCGACTTCT TCTTGACAC GACCAAATAT CGCTGGATCG CCACCTTTAA	9540
30	GTCTAACAAC CTTGTTATAT CGACGCGCTG CTCCACGAT ACAGTCATTT ATTTTTTCTT	9600
	GCTGAATATG TTTTGCATAC GGCTTTTAC CAACATCGAT AATTTAGTA GTCAAATTCG	9660
	CATATTGTAA AATTAACGGA TTCACTAATC GATCATATAG AATGACATCC GCTTCACGTA	9720
35	TTAAACGCTC AGCCTTTTTC GTCAAATAAT TCGGATTACC TGGACCCGCA CCTATCAAGT	9780
	AAACCTTGCC ATATTCCTCT ACAGACATAT ATATACGTTT CCGTCTGTAA CTTCTACCTC	9840
40	ATAAATCTCT ACACAACCTT CATCAGGTTT TTGAACAATA CCTGTATTTA AATCAATTTT	9900
	TTGATCGTGG AGCGGGCAAA ATACATATTC CCCACTCACT GTCCCTTCAG ACAATGGTCC	9960
	TTGTTTGTGT GGACAGATAT TGTGAATCGC ATGAATTTTG CCACTTTCTG TTAAAAACAA	10020
45	CCCTACCTCT TTGCCTTTGA CAATAACCTT TTTTCCAATT AGGGGTGTTA ATTCATCTAT	10080
	AGTTGTCACT TTAATTTTTT CTTTGTGTTT CATGTATTAC ACCTTCTCCA CTTCAAAAAT	10140
	TCTACGTGCT TGAGCATGTC TAGTTATTGC TTCCAAGGT TCAGCTTCGA CTGCTTTTTT	10200
50	AGCATCCATA ATGCGTTCAA ATAGTTCAAT TTGTCTTTCT GGGTCAAGTA AGACTTCTTT	10260
	TACATTTTCA AATCCAAGTC TTCTTAACCA TGGCGCTGTT CTTTCAGCAT ATATACCTGT	10320
55		

EP 0 786 519 A2

	AGTTGTTAAA AATTCAGCTT TTTCAACTTC TGTACCACCA TTACCACCGA TATAGATTTG	10440
	GAATCCATTT TCAACTGAGA TAATACCAAA ATCTTTAACA CCTGATTCAA CACAACTTCT	10500
5	TGGGCAGCCT GATACACCCA TTTTGAATTT ATGAGGTGTA TCGATGTATT CAAATGTTTT	10560
	TTCTAAACGA ATGCCAAGTC GTGTCGTGTA TTGCGTACCA AATCGACAAA ACTCTTTACC	10620
	AACACAGCTT TTAAGTGAAG GTGTTTTCTT ACCATAAGCT GATGCTGAAC GCATACCTAG	10680
10	GTCTTCCCAT ATATTTGGTA ATTCTTCTTT TTTAACTCCA TACAAACCAA CACGTTGTGA	10740
	ACCTGTCACT TTAAGTAGTG GCACATGATA TTTCTTAGCC ACTTCTCCTA GACGAATCAG	10800
	TTGGTCTGCA TCTGTAACAC CCCCACGCAT TTGAGGTATA ACAGAAAATG TACCATCATT	10860
15	TTGAATATTC GCATGGTAAC GTTCGTTAGC AAATCTTGAT TCTCTTTCAT CTTCATGATC	10920
	ATGTGGATAA ACCATGTTTA AATAATAGTT GATTGCTGGT CGACATTTTG GACATCCACC	10980
20	TTTATTTTTTA AAGTTTAAAA CATGTGCAAC TTCTTTAGAT GTTTTTAAAC CTTTCGCTCT	11040
	TATTTGCGTT ACTATTTGAT CGCGTGTCAA ATCAGTACAA CCACATATAC CAGCAGGTTT	11100
	TGCGGCAACA AAGTCATCTC CTAAGGTGTG CTGCAATATT TGAGCAATTT GCGGTTTACA	11160
25	TTTACCACAT GAATTCCTCG CTTTGTGTTT AGCCGTTACT TCTTCAACTG TTGTAAAGCC	11220
	ATTTTCCGTA ATCGCATTTA CTATAGTACC TTTATCAACA CCATTACAAC CACAAATTGT	11280
	TTTCATCATCA GCCATATCAG CAATTGATAG CGATGCCTCT TCTCCACCTT TAGTAAGCAA	11340
30	TGATACAAGT GTGTAATCTT CAGTGGATTC ACCTTTTTTC ATCATGTTAT AAAAGCGTGA	11400
	ACCATCATCG ATATCACCAT ATAGTACTGC ACCAACTACA TTACCGTCTT TTAAAAAGAT	11460
	TTTTTTATAG TTATTATCAA CACTATTAAA TATTTCAATA CCTTTAATTT CTGCATTTTC	11520
35	TACAATTTGA CCAGCACTAT ACAAGTCACA CCCAGAACT TTTAATGACG TAAATGTTGT	11580
	TGATCCCTTG TATCCGTTTG TTTCTTTATT TGTTAAATGA TCAGCTAATA CTTTACCTTG	11640
40	TTTCATATAGT GGTGCAACGA GTCCATAAAC TTTGCCGTTA TGTCTGCAC ATTCACCAAC	11700
	TGCATATACA TTGCTATCAC TTGTTTGCAT CACATCATTG ACAACAATAC CACGATTAAC	11760
	ATCTAGACCT GATTCTTTGG CTACTTCTGT GTATGGTCGT ATACCTACTG CCATAACAAC	11820
45	TAAGTCTGCC GGAATCTCGC GTCCATCAGC CAATTTAACA CCCTCAACAT CATCTTCTCC	11880
	TAAGATTTCA GTTGTGTTGG CTTGCATTTT AAACCTCATA CCTTGCTTTT CTAGATCTGC	11940
	TTTAAGCATA TTTCCAGCTT TACGGTCTAG TTGCATTTCC ATCAACCATT CAGCTAAATG	12000
50	TAAACCGTT ACTTCCATAC CTTGATCTAA TAAACCAGT GCACACTCTA AACCTAGTAA	12060
	TCCTCCACCA ATTACAATTG CTTTCTTTT AGTCTTAGCA ATGTTTCATCA TTTGTTCACT	12120

55

EP 0 786 519 A2

	GAATGCTTTA GAACCTGTG CAAAAATCAA TTTATCGTAT GATACTTCAA TACCATTGTC	12240
	AGTAGTAAGT GATTGATTG CTCTATCTAC TTCAATTACA GGATCATTG TAATTAACTC	12300
5	GATACCATGT TCCTCATACC ACTCATATGG ATTCATAATT GTTCTTCAA CTGTCATTTT	12360
	ATTTTGTAAG ATATTGAAA GCATGATGCG GTTATAGTTT GGATAAGGTT CTTTACCTAT	12420
	TACCGTAATA TCATATAAAT CGTTGGCGCG CTCTAATATT TCTTCGATTG TTCGAATGCC	12480
10	CGCCATACCG TTACCAATCA TTAGTAGTTT TTGCTTTGCC ATAAAATATG CCCCTTTACT	12540
	CCATAATATT TATTTCAAAA AAAGGTATTA ATTTTCGTT AGTGCTTTTA TATTTTCATT	12600
15	GGAATCATTG AGCTTTCTAA TCTATCGTTA ATGATTGCT TTAAGATTGG GTCGAAGTTA	12660
	ATTGAAGGTG TGAAGTGTAT ATCTGTATTA ATAACCATGT CATTCAATTG CTGCTTCACT	12720
	TTGTAAACAA GTCTTCCGTC ATATAAAAAT AATGGTACGA CAATCAATTT TTGATACCGT	12780
20	TTCGAGATGC TTTCTAAATC ATGTGTAAAA CTAATCTCTC CATATAGCGT TCTCGCATAT	12840
	GTGGGCTTGC TAATTTGCAA ATTTTGAGCG CATATTTGTA ACTCTTCGTG TGCCTTAGTA	12900
	AACTTTCCAT TAATATTGCC GTGTGCAACA ACCATAACTC CAACTTGTTG TTCGTCACCT	12960
25	GCTAATGCGT CACAAATACG TTGTTCAATT AATCGTCTCA TTAAAGGATG TGTGCCAAGT	13020
	GGCTCGCTTA CTTCTACCTT TATGTCTGGA TACCGTCGTT TCATTTTCATG AACGATATTC	13080
	GGTATATCCT TGAGATAATG CATTGCACTA AAGATTAGCA ATGGTACAAT TTTAAAATGG	13140
30	TCAACCCAC TTTGAATCaA CGTCGTCaTT ACCGTCTCTA AATCCtGATG CTCACTTTCT	13200
	AAAAACGCAA TATCATAGTG ATGTATATCA TCTTTTACTA ATTCAGAAAT AAATGCTTCT	13260
35	AACGCTTGaT TCTGTCTGCC GTGCCTCATG CCATGTGCAA CAATGATATT CCCATTCAAC	13320
	TTTACCAACC CTTTCACACG TATTGTATAC CAAATCATTT TGTTTTTGTG AAAAGAATCA	13380
	CATTATAATG TAAATCAGG GAATTCCTG ATGCCTGTAG TCATGCATAT TCCTTATACA	13440
40	TTTTCCCTTT TTGTTAAATC AAAAAAGCG ACCGATATAT GAATCCCTAC TCAACATTTA	13500
	TTTGAGCAAG CATTAAATATA TCGGTCGCTT GTAGTGATA TTATTATCTT AAAATGGTGG	13560
	TTGGCCTAAT ATTGTTTCGT CAAAGCGCTC GGTATCAAT ACTTTGCGCA TGATCACACC	13620
45	TAAATCGCCA TCATCATTTT CATGTTGCT GTATATTTCA TAACCTCTTT TTTCAATAAT	13680
	TTTAAGTAAC CACGGATGCA ATCTTGCAGA TGTACCTAAA GTAACGCG CTGACTTTAA	13740
	CGTATCTCGC AAAAATGCTT CTTCAACATA AGTAAGTAAT TGGCTACCAT AGCCTTTCCC	13800
50	TTCACTCTCA GGATTTGTG CAAACCACCA GACAAAAGGA TAACCCGAAA TACTTTTCAC	13860
	ACTTCCCCAA GGATATCTAA CCGTAATCGT AGATATAATT TCATCATCAA TTGTCATGAC	13920

55

CCAATCAATA CCTAGTTCTC TTAGAgGCGT AAATGCTTCA TGCATGAGTT CTTGCAATTT 14040
TTCTGCATCT T 14051

(2) INFORMATION FOR SEQ ID NO: 104:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1885 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 104:

TAATCCTCAA CTTnGATTAT ATGGCTTGGG CGCATATGAA CTGCTTAGTT TAGTGTATGA 60
CATTCATACA GTTCGCATGA CTATCATACA ACCTCGAATA GATAACTTTT CTA CTGAAGA 120
GTTACCAATC TCAAGATTAC TTCAATGGGG AACCGATTTT GTTAAACCCT TAGCCAGACT 180
TGCTTATAAC GGTGAAGGTG AGTTTAAAGC AGGTAGTCAT TGTAGATTCT GTAAGATAAA 240
GCATTCATGT AGAACACGTG CAGAATACAT GCAAAATGTG CCTCAAAAGC CACCACATTT 300
GTTGAGTGAT GAAGAGATTG CAGAACTTTT ATATAAACTG CCTGATATCA AAAAATGGGC 360
TGATGAAGTA GAGAAATATG CGTTAGAACA AGCGAAAGAG AATGATAAAA CGTATCCAGG 420
TTGGAAGCTA GTCACGGGAC GTTCAAGGAG AGTGATAACT GATACAAAAG CAGTCCGAGA 480
CAGGTTAGTT GAAGCGGGTT ATAAACCTGA AGATATTACA GAAACCAAGT TACTTAGCAT 540
TACGAATTTA GAAAAATTAA TCGGCAAAAA AGCATTTTCT AAAATTGCAG AAGGCTTTAT 600
AGAAAAGCCG CAAGGTAAAT TAACACTTGC TACCGAGTCT GATAAACGAC CAGCTATAAA 660
GCAATCTGCT GAAGATGATT TTGACAACT ATAAAAATTA AAAAGGACGG TATATAAACA 720
TGAAAGCAAA AGTATTAAAT AAACTAAAG TGATTACAGG AAAAGTAAGA GCATCATATG 780
CACaTATTTT TGaACCTCAC AGTATGCAAG AAGGGCAAGA AGCAAAGTAT TCAATCAGTT 840
TAATCATTCC TaATCAGAT ACAAGTACGA TAAAAGCCAT TGAACAAGCT ATAGAAGCTG 900
CTAAAGAAGA AGGAAAAGTT AGTAAGTTTG GAGGCAAAGT TCCTGCAAAT CTGAACTTC 960
CATTACGTGA TGGAGATACT GAAAGAGAAG ATGATGTGAA TTATCAAGAC GCTTATTTTA 1020
TTAACGCATC AAGCAAACAA GCACCTGGTA TTATTGACCA AAACAAAATT AGATTAACGG 1080
ATTCTGGAAC TATTGTAAAGT GGTGACTATA TTAGAGCTTC AATCAATTTA TTTCCATTCA 1140
ACACAAATGG TAATAAGGGT ATCGCAGTTG GATTGAACAA CATTCAACTT GTAGAAAAAG 1200
GCGAACCTCT TGGCGGTGCA AGTGCAGCAG AAGATGATTT TGATGAATTA GAACTGATG 1260

EP 0 786 519 A2

TTGAGGTGTC AAGAATTTGA AATTTATGAA TATAGATATT GAAACATACA GCAGTAACGA 1380
TATTTTCGAAA TGTGGTGCCT ATAAATACAC AGAAGCTGAA GATTTTCGAAA TTTTAATTAT 1440
5 AGCTTATTCG ATAGATGGTG GAGCGATTAG TGCATTGAC ATGACTAAAG TAGATAATGA 1500
GCCTTTCCAC GCTGATTATG AGACGTTTAA AATTGCTCTA TTTGACCCTG CTGTAAAAAA 1560
GTATGCATTC AATGCTAATT TCGAAAGAAC TTGTCTTGCT AACATTTTAA ATAAACAGAT 1620
10 GCCACCTGAA GAATGGATTT GCACAATGGT TAATTCAATG CGTATTGGCT TACCTGCTTC 1680
GCTTGATAAA GTTGAGAGAAG TTTTAAGACT ACAAAGCCAA AAAGATAAAG CAGGTAAAAA 1740
TTTAATTCGT TATTTCTCTA TACCTTGTA ACCAACAAAA GTTAATGGAG GAAGAACrAG 1800
15 AAACCTACCT GAACATGATC TTGAAAAATG GCAACAATTT ATAGATTaCT GTATTGAGA 1860
TGTAAGAAGTA GAAATGGCGA TTGCT 1885

20 (2) INFORMATION FOR SEQ ID NO: 105:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 2656 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
25 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 105:

30 TAATCCTTAG TCACTGnCA AATTTCAAAA CACCAGTTCC CTCTATCTGC ATCCATAGAA 60
ACTGnATGTT TGTGTCAATA ACCGGATTAT ATTGTGATGn TGTGTGTAAC TCGATTAAAGT 120
TATCATCTTT CGAAAAATTA TCTACTACCA TTATTCACC ACCTTTCCTT CGAATAAACT 180
35 CCATTACCA ACKCCACCAG TACCAAAGTT TCTAACTAAA AATTGATGTG CAGACGGGAA 240
GTTATTACGT CTTAATACTT GTGTTGTATT ACCTGGTGTA TCGATTTTAA CTTCTAATAT 300
CCAACCTGCA ATACCTTTAA AGTCTTTAGG AAAATCAGTA AATCGGTTTG ATTCTTCAGT 360
40 AGTGATATAG AAATCTAAAC CAACGATTTT TAAATCTGAT AATTTTGTA TACTCTTAGG 420
GATATGTTCC CAATAACCGG CGTTTTGCGG GCAGAAATTC CATGCTCCGT TGTTTTCTT 480
ATTGAAAATG TCAATGACAC GTTCGAATTT AAGCATATTT CTACCTGTGC TGTTTCTGGT 540
45 AAGTACTTGT CTTAGAGCAC CATTATAGTG TCCAGGCAGT ACATCCAAGA ACCACCCTGC 600
ATCTCTAAAC GCTTTCGGTA ACGGGAAATC TAATGCATTT TGTGTGTCTT GaCGTATAGA 660
50 TATAGTAATG ACCAACTTCC GTAATATCAC TTAGATATGC TGGGTTCTGT ATTGGAACG 720
GTTTAACACG TCCGCCTGAA TCAGTCATTG ATACTTGAGG TGCGATGTTT TTCAAGAATT 780

55

EP 0 786 519 A2

	TAGTTACCCC GATTAGAAGT GCTTTACGTC CTGTTTCTAG ATCGTAATAC ATATCTAGAC	900
	CCTCAGCCTC TTGGAAATCT CCTTTAAAGT TGTTATTAC ACCGCCTATA TCGATGCGAC	960
5	GTTTAAATAA CAATTCTTTC GTTTTGATAT CGAAGCCTTG TAAGTAGTTA GGGTTGGCTG	1020
	TATTCGAATC ACCTGTATAC CAATATAAGA TACCTGCATC ATAAGTGATA CCTTGCATAG	1080
	GTTGTGTATC TGAAGTGTAT TCCATAGGTA TATCCATTG ATACAATACT TTGTCTATAC	1140
10	CTTTATCAAT ATCGTCAGCA CTTCTAACCT CAACAAAGTT CAACGAATTC TTAAGTTGTC	1200
	TTTCAGTGGG TTTATATTCA CGTCTAAAAA TCATTAAATT TTCTACCGGA TTATAAATCG	1260
15	CTGACGTATA TCTGTCGTTA AATATATTTCG GCATGACATC TTGCATTTC TACCATAAG	1320
	TTATTTCTCC AGTTCTATAT TGGAAACGTA CAACTTGTT GTTTTTGTTA CTGTCCAATA	1380
	CAGCTGAATA AATCCATAAT TCTCCATCAA TGTATCTATA CGCATTGTGT GTACCGTGAC	1440
20	CGCCGTTTTT AACAGCAAT CTATCAATAA ATTGTCCGTT GGGCTTCAAT CTAGATAACA	1500
	TGTAATGATT ACCTGGACGA GCTTGCGTCA TATAAATAAT TTTCGTTCTA GGGTCTACCC	1560
	AAAATGATTG CATTACTGCA TTTGTATATG GCGATAAATC AGTGATAAAT TCCGTTCTT	1620
25	GCTCTTTTGG TTCGAATCGG TATCTGTCG CTCGATATTC TTTATAGTGT TCATCTACAG	1680
	CTTTCTCAAC CTTTTTAGTG AAAACATCTA GTGTTGAATA ATCATGATAC AAACGATCTT	1740
	GCAATGTCTT ATGACCATAA CCTGTATTAT CAACGCGCGC GTCTTTTACT TCGTTGATAC	1800
30	CGTCGCCGTT ATGACCTAGT ACCATGTTGC TAAATCGACC GTTTAAATAT GTTAAAAAGT	1860
	CAGAGACGTT ACTTGTAACA TTTAAATGTT CATACTTTAT TTGTTCTCCA TCATGTGCGA	1920
	ATACCTCTTT ATTTCTGTGG TATTCAAGAG AGAAATTAAA ATCCGTCAGC ATGTCTGAAA	1980
35	TAAGTTTAAA GTTATACTCA TTTTCATCTA CATATCTGTA GTCAAAGACT CTACTTAAAT	2040
	CTGTAAATTAG TTTATTACTC ATGTTTTCTT CCTTTACTAT CCATAAACT GATmATAATT	2100
40	TTTAATAAGC TCATACATAA TAACTTCATG ACCTCTTTCA TTAGGATGTA ATCCATCAGG	2160
	CATGCTAGAT TTTCTAAATG CTGGATTATA TGGTTTGAAA TAATCTGTGT GATAAGCATC	2220
	ATATACTGGT ACATCCAATT CACTACAAGC CAATATCTGA GCATTGACAT AATCCTCTAA	2280
45	AGTTAACCCCT AGTTTGTTTT TGTCCGTATC TTTACGGCGT ATCGTTGTAC CACTCATAGG	2340
	GCATTGCCTA GTAGCTGTCA TTACAAGTAT TTTTGAAGCT GGATTATTTT TCCTGATAAC	2400
	TTCAATTGCA GAACAAAAGG CGCCGTAAAA CGTTTTAGTG TCGGTTTTAT CAGTGCCTAT	2460
50	CGGTACGCCT GCCCAATAAC CATGTAACCA GTCATCATCT GTACCTTGTA ATATGATTAG	2520
	GTCTCCTCTT ATTTGCTCTG CTTGTCTaTA AATGCTGTTT TCTaCCGCTT CTTTACCTAT	2580

55

CTTGCCTAAC ATTTCT

2656

(2) INFORMATION FOR SEQ ID NO: 106:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 4854 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 106:

15	AAAATGAGGG TTCTAGCGGA AATTACCAAA AGCGTGGTTC ATACTATGGG CAGCGTAATC	60
	GTATTTCAAA AGAAAAACA CCTAAATGGT TAGaAAATAG AGATAAACCT AGTGAAGAAG	120
	ATTCGGCTAA AGATAATAGC GTAGATGATC AACAAATTAGA GCAAGATCGA CAAGCATTTT	180
20	TAGATAAATT ATCTAAAAA TGGGAGGAGG ACAGTCAATA ATGAAGCAAT TTAAGAGTAT	240
	AATTAACACG TCGCAGGACT TTGAAAAAG AATAGAAAAG ATAAACAGAG AGTAATCAAT	300
	GACCCAGATG TTAAGCAATT TTTGGAAGCG CATCGAGCTG AATTmACGAA TGCTATGATT	360
25	GATGAAGACT TAAATGTGTT ACAAGAGTAT AAAGATCAAC AAAACATTA TGACGGTCAT	420
	AAATTTGCTG ATTGTCCAAA TTTCGTAAAG GGGCATGTGC CTGAGTTATA TGTGATAAT	480
	AACCGAATTA AAATACGCTA TTTACAATGC CCATGTAAAA TCAAGTACGA CGAAGAACGC	540
30	TTTGAAGCTG AGCTAATTAC ATCTCATCAT ATGCAACGAG ATACTTTAAA TGCCAAATTG	600
	AAAGATATTT ATATGAATCA TCGAGACCGT CTTGATGTAG CTATGGCAGC AGATGATATT	660
35	TGTACAGCAA TAACTAATGG GGAACAAGTG AAAGGCCTTT ACCTTTATGG TCCATTTGGG	720
	ACAGGTAAAT CTTTATTCTT AGGTGCAATT GCGAATCAGC TCAAATCTAA GAAGGTACGT	780
	TCGACAAATTA TTTATTTACC GGAATTTATT AGAACATTAA AAGGTGGCTT TAAAGATGGT	840
40	TCTTTTGAAA AGAAATTACA TCGCGTAAGA GAAGCAAACA TTTTAATGCT TGATGATATT	900
	GGGGCTGAAG AAGTGAATCC ATGGGTGAGA GATGAGGTAA TTGGACCTTT GCTACATTAT	960
	CGAATGGTTC ATGAATTACC AACATTCTTT AGTTCTAATT TTGACTATAG TGAATTGGAA	1020
45	CATCATTTAG CGATGACTCG TGATGGTGAA GAGAAGACTA AAGCAGCAGC TATTATTGAA	1080
	CGTGTCAAAT CTTTGTCAAC ACCATACTTT TTATCAGGAG AAAATTTTCA AAACAATTGA	1140
	ATTTTAAAT GATTGGTGTA TAATGAATAC AAATCTAAAT CGTTTAAATG ATTGAAGACA	1200
50	AGATGATCTA ATCAATATTA CACAGAAAGC CATTGTTTGA TGAGAATATG GTTAATAAAT	1260
	TAGATGATTA CTAATTCATT TATGGTATTT GTAATGAATA CCCGGATCAA GACCGTTATC	1320

55

EP 0 786 519 A2

	CTCGTCCCTT GTATAGGGGC GGGATTTTTT GTTTTTTCA GACATAAATG TTTGTTGGTG	1440
	TCATAAATTC CCTGTTTATT GTTAATAGGT TTAATGTAA AACGATGATT GTTGTTCAT	1500
5	TTTTTAACGA GGTCAGATAA AAGTATTTAT AAAGCAAATA GGAGGGTTA ACATGGAACA	1560
	AATTAATATT CAATTTCCAG ATGGTAATAA AAAGGCGTTT GATAAAGGTA CTACTIONCTGA	1620
	AGATATAGCA CAATCAATTA GTCTGGATT ACGTAAAAA GCTGTTGCCG GCAAATTTAA	1680
10	CGGGCAACTT GTAGATTTAA CTAAACCGCT TGAAACTGAT GGATCAATTG AAATTGTGAC	1740
	ACCAGGTAGT GAAGAgcGT TAGAGGTATT ACGTCATTCT ACTGCACATT TAATGGCACA	1800
	CGCGATTAAA AGGTTATATG GTAATGTAA ATTTGGTGTA GGTCTGTAA TAGAAGGTGG	1860
15	ATTCTACTAT GACTTCGACA TTGACCAAAA CATCTCATCT GATGACTTTG AACAAATTGA	1920
	AAAAACAATG AAACAAATCG TTAACGAAAA TATGAAATC GAACGAAAAG TGGTTTCACG	1980
20	AGATGAAGTG AAAGAGTTAT TCAGCAATGA TGAATACAAA TTAGAATTAA TCGACGCGAT	2040
	TCCTGAAGAT GAAAATGTAA CATTATATAG TCAAGGTGAT TTTACTGATT TATGTCGTGG	2100
	AGTTACGTT CCATCAACAG CTAAATTAA AGAGTTTAAA CTATTATCTA CAGCAGGTGC	2160
25	ATACTGGCGT GGAGATAGTA ACAACAAAAT GTTACAACGT ATATACGGTA CTGCTTTCTT	2220
	TGATAAAAA GAATTGAAAG CACATTTACA AATGTTAGAA GAGCGTAAAG AACGTGATCA	2280
	TCGTAAAATT GGTAAAGAGT TAGAACTATT CACAAATAGC CAATTAGTTG GTGCTGGTTT	2340
30	GCCATTATGG TTACCTAACG GTGCAACAAT TAGACGTGAA ATTGAACGTT ACATTGTTGA	2400
	TAAAGAAGTT AGCATGGGAT ATGACCACGT TTATACACCA GTACTTGCTA ATGTTGATTT	2460
	ATACAAAACA TCTGGTCACT GGGATCACTA TCAAGAAGAT ATGTTCCAC CAATGCAGTT	2520
35	AGATGAACT GAATCTATGG TATTACGTCC AATGAACTGT CCACATCATA TGATGATTTA	2580
	TGCGAATAAA CCACATTCAT ATCGTGAATT ACCTATCCGT ATCGCTGAGC TAGGAACGAT	2640
40	GCATAGATAT GAAGCAAGTG GTGCTGTATC AGGATTACAA CGTGTTCGTG GTATGACTTT	2700
	AAATGATTCA CATATCTTTG TTCGACCTGA TCAAATTAAA GAAGAATTCA AACGCGTTGT	2760
	AAACATGATT ATTGATGTGT ATAAAGACTT TGGTTTCGAG GATTATAGCT TTAGATTAAAG	2820
45	TTATAGAGAC CCTGAAGATA AAGAAAAGTA CTTTGATGAT GATGATATGT GGAATAAAGC	2880
	TGAAAATATG CTTAAAGAGG CAGCGGATGA GCTTGGCTTA TCGTACGANG AAgCGATTGG	2940
	TGAAGCGGCA TTCTATGGTC CGAAACTAGA TGTTCAAGTT AAAACAGCGA TGGGTAAAGA	3000
50	AGAGACATTA TCAACAGCAC AACTTGATTT CTTATTACCA GAACGTTTTG ATTTAACTTA	3060
	TATTGGTCAA GATGGTGAAC ATCATCGTCC AGTTGTTATT CATCGTGGTG TTGTATCAAC	3120

55

	AGCGCCAAAA CAAGTTCAAA TCATTCCAGT TAACGTTGAT TTACATTATG ATTATGCGCG	3240
	CCAATTACAA GATGAATTGA AATCTCAAGG CGTTCGTGTA AGTATTGATG ACCGTAATGA	3300
5	AAAAATGGGT TATAAAATCA GAGAAGCTCA AATGCAAAAA ATACCTTATC AAATCGTAGT	3360
	TGGGGATAAG GAAGTTGAAA ATAATCAAGT GAATGTGCGT CAATATGGAT CGCAAGACCA	3420
	AGAAACAGTT GAAAAAGATG AATTTATCTG GAATCTAGTT GATGAAATTC GTTTGAAAAA	3480
10	ACATAGATAG ACAGTTGTCT CAATAAAATG CTTTAAAACT TTTATTGCGT ATCAAGTTTT	3540
	ACAGGGTTGA TTATGCGTGA TGAATCCTGT ATATTACAAG TTAGTTAAAA TATTAAATTG	3600
	AGTTAGAGGT TGCATGTTTA ATTAGTAACT TGTCAGAAGT ATTTATGGTA CATAAGTTGA	3660
15	ACAAGTGAAA GGTAAAGATG CCGAAATAGA TATAAACCAT AAATTATATC TATTGGGACA	3720
	GTTTTCGAAT AGGAACTGTA CTGTCACAGA ATGTGATGTG CTACCTTATA TAGATAATTG	3780
	CCAAAGTGGT TGCATATCTT AAAGGTATGT AGCCACTTTT TTACTTTTAA TATCACTATG	3840
20	TTCTGTAAAA AAGGGTATGA AAGTGAATAA AGGTTATTTA TTTCTTGGCC TCTAAAACAT	3900
	GGAAAGGGAG CTTATATGTC AAAAGTTCAA AATGAAAGTA ACAATGTTGT CAAAGGGGA	3960
25	CTTAAAGATC GTCATATTTC TATGATTGCG ATTGGGGGTT GTATTGGTAC AGGTTTATTT	4020
	GTAACCTCTG GTGGAGCAAT TCATGATGCA GGTGCTTTGG GTGCATTAAT AGGATACGCA	4080
	ATTATCGGAA TAATGGTATT TTTCTTAATG ACGTCACTTG GCGAAATGGC TACGTATTTG	4140
30	CCAGTATCAG GTTCATTTAG TACATATGCT ACAAGATTG TTGATCCATC TTTAGGGTTT	4200
	GCGCTTGGTT GGAACATTG GTTTAACTGG GTAGTGA CTG TAGCAGCAGA TATTACGATT	4260
	GCAGCACAAG TCATTCAATA TTGGACACCA TTGCAAGGCA TACCCGCTTG GGCATGGAGT	4320
35	GCGTTGTTCT TAGTTATAAT TTTTAGTCTG AATTCGTTAT CAGTTCGCGT CTATGGTGAA	4380
	AGTGAATACT GGTGCGCATT GATAAAAGTG GTTACAGTTA TTGTTTTCAT TGCAATTGGT	4440
	TTATTAACGA TTGTCGGAAT CATGGGTGGT CATGTTGTAG GATTCGAAAT ATTTAATAAA	4500
40	GGTGAAGGTC CAATCTTGG TGGCAACTTA GGAGGAAGTT TGTTATCAAT TCTAGGTGTA	4560
	TTCTTAATCG CTGGTTTCTC ATTCCAAGGT ACTGAGTTAA TTGGTATTAC GGCTGGTGAA	4620
45	TCAGAAAATC CTGAACGTGC TGTGCCGAAA GCAATTAAAC AAGTATTCTG GAGAATTTTA	4680
	TTATTTTACA TTTTAGCCAT TTTGTTATC GGTATGTTAA TTCCTTATGA TAGTAGTGCA	4740
	TTAATGGGGG GTAGTGATAA TGTAGCAACG TCTCCATTCA CATTAGTGTT TAAAAATGCT	4800
50	GGATTTGCGT TTGCAGCATC ATTTATGAAT GCAGTCATTT TAACGTCTGT GTTA	4854

(2) INFORMATION FOR SEQ ID NO: 107:

55

(A) LENGTH: 2488 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 107:

10	ATCAAAAATT GATTGTTTTT nATTTTTTGT TTCAGCGCGG GATCTTTTAC GTCTTTTGTG	60
	AAAACGaTTT TATTATTAAC TACTTTTACT GGATAACTTT TGTATGTCGA GTCAGTAGCA	120
	TTTTTCTAT CGTTTGTAGT TGTGTCATAT TCACCAgTTA TTTTATGTGT GTTCTTATCT	180
15	ACCTTTAACA ACATACGGTC TTCTTTTAAA AGCTCATCTG ATCCAACAAC TGAATAAGAG	240
	GATTCTATAT ACCATGTGTC TTGATCAITA TTTTCATAAT GGGGATTATC GTGACCATCA	300
	ATTTCATAAA GCGTTTCTAA GTTTTTAATA GGATACGTAC TTAGTACTTT TTTAAGACCA	360
20	TCTTTCAAAT GAATTTGTTT CCACTTCATT GCCAAAACA TATCGCCACT GACTACAATT	420
	GAAATAATAA TAATTGCTGC TAAGTTTAAAC CAGAAAATTT TATGTGCTTT CATACATTCC	480
	CACCGTTTCT CAAAATACTT CATTAACTACT ATAATAATAT ATTTTGAAAA ATATTTACAT	540
25	CAGTATTAAA GTGAATATCA AATTTTAAAT TTATGAAAAT AATAGATATT TATAAAAAGC	600
	GGAAAAGAGA TACAATAAAA AACTGCATGA CGTTTGAGAC GTCACACAGT GTAACATAAA	660
30	ATTTAAAAAG TGTTTGCTAA TTTTTCAGCA TTATTAATAC TAGTTGCTTT AATTTCTTCA	720
	GTCTTATGAG GTTCAGCATT GTGTCCTTCA ATAATGATTG TTTCATATGA TGGCACACCT	780
	AAGAATGTCA TAATTGTTCT TAAATAACGG TCACCCATTT CAAAATCAGC AGCAGGTCCT	840
35	TCAGTATAAT ATCCACCACG TGATTGAATG TGTAATACTT TTTGTGCGT TAGTAAACCT	900
	TGTGGTCCTT CAGCAGAATA TTTAAAAGTT TTACCTGCAA TTGAAATAGC ATCAATATAT	960
	GCTTTAACTA CAGGTGGGAA AGAAAGGTTT CACATAGGCG TTACAAATAC ATATTTATCT	1020
40	GCACTTAAAA ATTCTTCTAA AATGTCACCTC AATCTTGAAA CTTTCATTG TTCATCATCA	1080
	GTTAACGTTT CGCCATTACT CATTTTTCCC CAACCAgTTA ATACATCTTT GTCAATAACT	1140
	GGAATATAAG TTTCArATAA ATCAATATGT TTCACCTCAT CATCAGGATG TTGTTGTTGA	1200
45	TATGTTTCGA TAAATGCTTT ACCAGCCGCC ATAGAATTTG ATACCAGTTC ATTAAAAGGG	1260
	TGTGCTGTAA TATATAATAC TTTTGCCATT TGAAAATTCT CCTCTGkTTC TGTTATTTTC	1320
	TTAAGTATAA TTATTATACT CGATATAAAA TTTAATATCA ATCAAAATAT TCAAATTACC	1380
50	ATCATTTTCT TCATCTATAT nTGGCAGTAC TACTAAAGTA TGAGTGCAAT TAATTATGAa	1440
	ATAGTTGATT TaGAATaTAT ACTTAATACC CAAAATATAT GAAGGATGGA TGCCACTATG	1500

55

EP 0 786 519 A2

ATTATTTATA TAGATGACAT TCAAAAATGG TTTAACCAAT ATACCGATAA ATTGACACAA 1620
AATCATAAAG GACAAGGACA CTCAAAATGG GAAGACTTTT TTAGAGGGAG TCGGATTACT 1680
5 GAGACTTTTG GTAAATATCA ACATTCACCA TTTGATGGTA AGCATTATGG CATTGATTTT 1740
GCATTGCCAA AAGGTACACC AATTAAAGCG CCGACGAATG GTAAAGTAAC ACGTATCTTT 1800
AATAATGAAT TGGGCGGCAA GGTATTACAG ATTGCCGAAG ACAATGGAGA ATATCACCAG 1860
10 TGGTATCTAC ACTTAGACAA ATATAATGTC AAAGTAGGTG ATCGAGTCAA AGCAGGTGAT 1920
ATTATTGCAT ATTCAGGCAA TACAGGTATA CAAACGACAG GCGCACATTT ACATTTTCAA 1980
15 AGAATGAAGG GTGGCGTAGG TAATGCATAT GCAGAAGATC CAAAACCGTT TATCGATCAG 2040
TTACCTGATG GGAACGCTAG CCTATATGAT TTGTAGTTAT AGAAGGGTGC CCGCAGTCTA 2100
AAAAATTAAG CAATCATTGT GTGAGTATGA TACTTACATA ATGGTTGCTT TTTTCAATGA 2160
20 AAATCGTAAT GCTAAGTCAT ACTTGTTTGA TTTAGATATT ACTTAAAATG TAAGACAAGG 2220
TTGTTAGCAT TGGCAGTGAA ATATCGCACA TAAAAACAT TATTGTCACA CTAGAAAATA 2280
GTTGTGCACT ATATCAATTT TCTGTATAAA AGTTTAATTC TGACAGTAAT GTAAACGTTT 2340
25 ACAATTTATG ATTGACATTA ATAATGACTG AATATATGAT TTATGTAAGT ATTTGTGCAA 2400
CGTTTTTACA AAGTGTATTG CACaAyCAAA CTGtAAACaA aGTATGGGGg GCCATAACAT 2460
30 GGCAGAACTA AGTTAGAGCn TATTAAAA 2488

(2) INFORMATION FOR SEQ ID NO: 108:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 4093 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 108:

TTTTCTTTAT TTCAAmCTGT ATATTaATGA TGTCACCTTCA TTTGATACGA TTCTTGATAA 60
45 CCTATTCAAA ATTCCGCCAA ATAAACATAAA TATTATATAA ATGCCGATAC TTTTAATCAT 120
TTTCTACTTT TTCTTCGATA CGGAAACTTG TTTTCGAATT GAACACTTCA CCAGCTTTTA 180
AAATTGACGG TGCTTTTTTCA CCATATAAAT TAATATCATT TGGTAAAAAT TGTGTTTCTA 240
50 ATGTAAAGCC AGAATGTGGT TTATAAATAT TAAATGGACT ATCCCACTCA TCAGGCTGGT 300
TAAAGTAAA GAACACAACA TGAGGCATAT CTGTATCGAC CTCTAACATA AATTCATGAT 360
TTTCAACATA CATTTTATGT TCACCAACTG TAAATGGGTG ATCGAGACCA CCAAAACGTG 420

	TATCTTCAAA CACTTCATGT AAATCTAGAA TATCACCTGT AACAAATATTT CGCTCATCTA	540
	ATACATACAT ATCTAATTGA TTACTTGAAA TGCGATGATT ATCAACGACA TTATTATCTC	600
5	GATTCAAATT GAAGTACACA TGATTTCGTAG GACTAAACAA TGTGTCTTCT GATGCAACTG	660
	CTTCGTATTC AATCGACCAT TGGTGATCCG CATCATAAAT ATGTGTAATC GTCACATCGA	720
10	TATCACCCGG GAAATGATCA TCAGCTGATT TCAACACCGT CTAAATATA ACTTTAATTT	780
	GAGCAATTTT ATTTCTAATT TCATAATCAA ATAACCTTATT GTCCAAACCA TGACATCCAC	840
	CATGTAAATG ATGTTACCG TTGTTTTTTT CTAACCTGATA TTCTTTACCT TTCAACTTAA	900
15	ATTTAGCATT ATCAATTCTA CCGCTATATC TTCCTATAGA AGCACCAAAT TTAAAAGGAT	960
	TACTATGATa AAATTCATCC GCTTCAACAA CATTTCCAAG AACAAATATTA TTATCATGAT	1020
	ATTTCCAAGA CACTACTCTT GCTCCATAAT TCGTAAAAAT AATTTTAGTT TCATCATTAT	1080
20	CAATTTTGAT TAAATCTACA CCTTGCTCTT GGTGCTCAAC TTCAACTATC ATTTTACTT	1140
	CTCCCTTCTA ACCACAAGTG TTCAAGCTCT GCTGGGTAGC AACATTACTA AAACACCTAC	1200
25	AATACAAATG ATTGCACCGA TAACATCATA TTTATCTGGC ATTTGTTTAT CTACGACCAT	1260
	CGCAAAAATC AAACCTCATG TGATAAATAC GCCACCATAT GCTGCATATA CTCTTCCGAA	1320
	TGATGGAAAT GATTGAAATG TCGCAATGAC ACCATATAAC ATGAGTATCG CACCGCCTAT	1380
30	TAGCCCAACA AGTGAAGACT GTCCTTCCCT AAGCCACAGC CAAATCAGGT ATCCCCCACC	1440
	TATTTACAT AAGCCAGCTA ATATAAATAT AAAAATCGGA TATAACATGA AATCACTCCA	1500
	TCACACATTT GCTATCAATA ATCTATCGGC TACATATCAT TTGTTTACAT TTCTTCTTAC	1560
35	TTCACATTCC CATTTTAAAA AGTTCGTTTT CACATTGATA TTGTACACTT TTTTAGACAT	1620
	TATTCTATAG CTAAATATAA AAAAATAAGA GTAACACGCT TTCATCATCA TTTTATATGA	1680
40	TAAATGTGTG TCACTCTCAT CAATTTTATT TTTTAAATAC ACGTTTCATT GAATTAAATA	1740
	AGCCACGTTT AAATGTAAGT ACTGAATCTT TATATGTTTT AATTGCAATC CATATCAAGA	1800
	CAGCTACCAT TACAATTGAG ATTAAAGAAC TTAAGATGAC CTCATATATT TGAAGCCCTG	1860
45	AAGTTTGAGC GCGTACAAC AATTGAAATG GCGCTAAAA CGGAATATAA CTTGTGATTA	1920
	AAGCAAGTTG TCCATCAGGA TTATTTATCG TGAATATCGC GATATAAAAT GCAATCATAC	1980
	CAAGTAATGT CAGTGGCATC AAAGATTGAT TTAAATCTT TATTCTAGAT GTTAATGATC	2040
50	CGAGGATGGC TGCAAGTAAT ACATACGCCG TAATTCCAAC AATACTACTT ATAATTCCGA	2100
	CAATAATAAT TTGCCAAGAC AATTGATTCA TTTCCACGTT AAAACCTTGT AGCAAGTCTT	2160
55	TTAAGTCAAA GGCAAAAATG CATATAACTG CCATCAATAC AATTAAAATA ATCTGAGTCA	2220

TAATAATCAT TTCAATGACA CGCGATGTTT TCTACTAGC AATTTCCATA GCTATTTGAG 2340
 ATGCATAATT TAAAACAATG AAGAACATTA GAAAGATAAT GCCATmaGcT AAAGCATAGT 2400
 5 TGAAATCTT TTGTCCTTCT GATACTTTAT CGACTTCATC ATTAGAAATC ACCTTATTAT 2460
 CAACTTTACT TTGTGCTTGT AATTTTTGTA AGTCTTCTTT GTTGATATTT AATCCCCGG 2520
 CTACCATATT TGTGTTGAATA GCTGTAAGCA GTGCTTGTAC TTTTGTGAA TCTTCATGAC 2580
 10 TTAAGCTTT ATCAAGTTA TGTTTTTTA CTCTTTTTC AGCATCTTCT ATAGAACTT 2700
 TAGTAACTT AGCATCACTA TGAAATGTAT TCGCCTGTTG CTGAAAACC TTATAGATTT 2760
 15 GTTCATTCCG TGCTGCTACA CCAATTTTAT CTGGACCATC ATCAAACATG TTAATAATCT 2820
 TATCAATGTT AGATAGGCCA ATCATTAAGG CAGCAATAAT AATCATAAAA ATTACAAATG 2880
 20 ATTTAGCTTT AATTTTTTTG ATATATGTCA AAGTAAATGT CGCCCAAAAC TTATGCATCC 2940
 TTGCCACCAA CCTTCTCAAT GAATATATCT TGTAAATGATG GTTCTACAAC TTGGAATCGT 3000
 TTAACATAAC CTGATGTGC CACAACCTGA TAAATATCTT TGGCTACGTC TTCATTCTCA 3060
 25 ATCGTCAACT GAAGACCTTG CTTCATGTTT TCACTATGAA TGATGCCTCT AATGTTTGTT 3120
 AAATCTGGTA GTGTTGTTTC TGATTCAATG ACAACTTTCT TGTTACCATT AGATGCACGT 3180
 ACATGATTGA TATCACCAGA AACACAAGT TGACCTTTAT CTAAAATACA AACATCATCA 3240
 30 CATAATTCTT CAACATGCTC CATACGGTGA GAACTATAAA CGATTGTACT GCCCAATCA 3300
 TTAAAGTCTT TAACTGCTTC TTTAATAAC TCAACATTAA CTGGGTCTAG ACCACTGAAA 3360
 35 GGCTCATCTA ATATTAGTAA TTCTGGTTTA TGTAACATAC TTGCTAACAG CTGAATTTTT 3420
 TGTGATTCC CTTTGATAG ACTATCAATT CGTTTTTGC GGTTTTCAGT AATATCAAAA 3480
 CGCTCAAGCC AATACGATAT TTGCTGTTGT ATTTCTGTTT TTGACATTCC CTTTAAAGTT 3540
 40 GCCAAATATT TCAATCTTC TTCAACTGTC AATTTCCCAT GTAAACCGCG TTCTCCGGT 3600
 AAATAACCAA TACGATTGTA CATTGTTTTA TCTAGTTTTT TACCGTTATA CGTrrTGTGT 3660
 CCTCAGTTG GTTCACTTAA GCCTAAAATC ATACGAAATG TCGTTGTTTT ACmTGCACCA 3720
 45 TTTCTTCCTA GAAAACCTAA CATTTTACCT GATTCTAACT TTAATGAAAT ATCATTTACT 3780
 GCCGTCATCT TGCCAAAACG TTTCGTAACA TGTTCATTA CAAGTCCCAT ACTTGCCTC 3840
 50 CTAAAAAnAT ATGTATTTAT CTTAATATAA CATTTCCATT CTCTATAAAT GCAATATTTT 3900
 TAAATGAAT TTATTTTTAA AATTTCTGAA ATTGAAAAAT TTAAATAGTG CCATTTTTGC 3960
 ATGTTAAGTA TCATTAGCAC TAGATATGTT TTTCCATGC CTTTATTGCC TTATTTGTAA 4020

55

CTTnCCGGTG TTT

4093

(2) INFORMATION FOR SEQ ID NO: 109:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17846 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 109:

15	TGCCAAACTA CCTTTTGACA GTCGTTGCTG TACTTCAGGA TGATCAATCA CATATnTTAC	60
	TTTATCAAAT AGGGCATCTT CATCATTTTT AGTAATTAAA TAACCATTGA AATCTGAAGT	120
	AATCAGTTCG TTAGGTCCAT ATTTAATATC ATAACTAATA ACTGGAACAC CATGTGCTAA	180
20	AGATTCAAGT AGCGCTAAAG AGAAACCTTC CATGTTACTT GTTATTAAAC TCAAATAGGC	240
	ATCGCTATAT TCTTGGTCTA GATTGCTTAA AAAGCCGCGT AAGTAAACAT GATTTTCCAA	300
	TCCATATTTT TGTATCAATT CATTTAATTT TTTACTTTCA GAaCCAAAAC CATACATATG	360
25	AaGCTCTATT TTTGGGACAT ACGATACTAA GCGTTTAATT AATTCAATTT GTTGATGTAA	420
	TTGTTTTTCA GGTGAATAAC GAGCAACGGA AATTAATTTA AACTGCGCT GATCTAATGT	480
30	TTGGACTGGT GTATCAATTG TTTCACTATA GCCGACAGGA ATATTAACAA CTGGAATAGT	540
	ATGGTTAATA CGTTTTTCAA CATCTAATTT TTGCTGCTCA GTAGAAACGA TAATTGCACG	600
	ATATCGAGAT AAATTTTCAA ACATCGCTTT ATATACATTT TTAAATGGCG ATGAATCTAA	660
35	TGCATCAATA TTTTAAATGT GTGTACTGTG AAGCACAGCT ACTACTGGGA TTGACTCAGG	720
	CGTTAAGTTG AAAATAGGTG CTGTGTACAC ATTACGATCA CTGAAAAATA AATCCCCATG	780
	TTGATATAGT TGTTTAATGA AAAATGCGCC TAATTCCGTT TCATTATTAA AGAAATATTG	840
40	TTTGTTAGCA TAGTAAACAA TAATTTTTTG TACTTCTGGT TTGCCATCCT TGTAGAAAA	900
	ATACTTTTCT AATTTTGTGT CACCTTCTGG ATTATAGAAA AATTCACATA ATGTTTGTG	960
	TTTATCAACA AGAATCCTAC TACAACTTAA AAAGCCACGC ACATCATAAA AATCACGTTT	1020
45	TACTTtTCGT CTTTGACTAT CAAATGATT TACATAATCT AATATACGAT ATTTAGGATC	1080
	TTGAAAATGG GCATACATTA AGAAACGCTC TTGATCATAT ATTCTAAAGT CATGACTATT	1140
50	TTCAACATGT TTTAAAGTAT AATGACATTC ATCAGTCCAA TACGACAACC AGTCAAATGG	1200
	TTCATTGCGT TCTAAATATG TTGCTTCTTG GAAGAAATCA TACATATTAA TATAGTCAGA	1260
55	ACTAGTAATA TAATTTTGGG CATTTCTATA TAAATATCTA TTCCATGACA GAAATACACA	1320

EP 0 786 519 A2

	CCCAGTTAAA TTAACACCTA AACTATTACC TACAAAATAA TTCATTTACA ACACCACTTA	1440
	TATCTATTTT TTATAATTAT ATCACATAAT ATTTAATTAC TTCTTTTAAC TGGAAGATGT	1500
5	GTTTATTTAT AAAACAACAA ATTTTGATAT TTATAATGAT AGTAGTTATT CAATCAcTAC	1560
	GACCCaATAT ATCATkGTAG AGCTTAGGAT ATTGATTTAT GACTCAGGCA CATCAAATGa	1620
10	GAgGATTTAT AAArGAGATA TACAACTCTA GAAGGTATAA TAAAAACGCG CAACTAATGT	1680
	TACGCGTTTG AATTAATCAT ATGATATTAT TTGCGATACT TTAATTTAGC GAAAgcATCA	1740
	TGTTGATGGA TAGACTCTTC ATTACGACAT TCGATATCGA AACCGTCTAA CCAATCAAAT	1800
15	TCAACTAAGT CCGCGGCAAT TAAACGAATT AAGTCTTCGA CAAAACGTGG ATTTTCATAT	1860
	GCACGCTCTG TCACACGTTT TTCATCAGGA CGTTTTAAAA TAGGGTATAG AATTGAACTT	1920
	GCATTAGCTT CCATTGCATC TAAAATTTTA TTTTATAGT CATCAACTAT GTCTTGATCT	1980
20	TTATTAATAT ATGTTTTAAC AGTGACAACA CCACGTTGGT TGTGCGCTGA ATACTCACTT	2040
	ATTTCTTTTG AACAAGGGCA TAGCGTTGTG ACAGTTGCTT CAATAGTAAG TTCTTTACGT	2100
	GTAnCTTTAT CACCGTCAAT TGCTAATCCA TAAGTGACAT CGGCATTACC AACTGCTTTA	2160
25	ATATTTGTGG TTGGAATA GCGATCAAAG AACCATTTC CAGAAACATC AACGCCTGCC	2220
	GCATTTTGTG TCATATTCGT TTGTAAAGTG CGTAACACCT GATAAAGTGT ATTAAATTCA	2280
30	AGTTCAATAC CATTATCATA GTGCTTTTCA ACACTTTCGA TTATACGGCT CATATTAATA	2340
	CCTTTTTTCGT CTTTTGTAA ACTTGTGAA AACTAAATG TGCCAGCTGT TTGATACTGG	2400
	TCAACAAGTA CAGGGTACAC TAAGTTTTTA ATACCAACTT CTTCTATTTC AAATAAAAAA	2460
35	TCTTTATGTG TACTTTGTAA ATCTGTCATT TCGTCTTAG TAGTAGGTTT CGTGCCCTCA	2520
	ATAGGATCTA CGGAACCAAA GTGTTTCCAA CGACCTTCTC GTGTCGATAA ATCAAATTCA	2580
	GTCA T TTTTT TCCTCCGTTA AGATTTAAAG TGATATGTCC AATATGGTTC GACTGTAAAA	2640
40	AAGCTGTGTT GTTTACCATC GATTTCAGGA CTTGCTAATT GTTTTAAAAA TGGACCTGTT	2700
	TGAGAAGCAT GTGCTTCAAA TGCCTTAATT TTAAGTTCTT TAAAATCTGT AATATCATTT	2760
	TGAATATCAG GTTCTCCAAG AGCTTCGGTT GCATCATTAC TGAACGCAAC TAAAGTTAAA	2820
45	CGAGGGCGTT CTTCTTTAGG CATGCGTTCA ACCGTTGCGA TTACAGCGTC TGCTGTTGCT	2880
	TCGTGATCAG GATGTACTGC ATATCCAGGA TAAAATGAAA TAATCAATGA TGGATTGTGA	2940
50	TCATCGATTA AAGATTTAAT CATACCATCT ATATGTTTAT AGGGTTCAAA TTCGACAGTT	3000
	TTGTACGTA AACCCATTTT TCTTAAATCA GTAATACCGA TAACTTTACA AGCTTCTTCT	3060
	AGTTCACGCT CACGAATACT TGTAATGAT TCGCGTGTTG CAAATGGGGG ATTACCTAAA	3120

55

	TAATTTGCTA ATGTGCCTGC AGATGAGAAG GTTTCATCAT CAGGATGTGG AAATATTACT	3240
	AATACATGTC TTTCGTCAGT CATGTTGATG CCTCCTCTAT AAATTAAATG GTCGCTCACT	3300
5	AATTTGAAGT GCTGCAGCGA GTTGACCTTC GTAATTAAAA CCTGCAATTA AAAATTCATC	3360
	ATGCTCATTG ACCTCAAAAT GCGTTAGACC TTGTACATAA ACCCAACCAC CATTTGATAG	3420
10	TTTAAGACCA ATGCGATAAG GTTCTTTTATT ACCACCTTTT AGTTGTGCAT GCGTATATGT	3480
	TATTTGTATG TTTCTTAAAA AAGTACCAGC ATTAAAAACA CGTTGATCGA AATGGTTCGC	3540
	ATAGGCCCCA TTGTGCGTTT CAACATGCAG ATACACAGGT TTATGTTCAA AAGAAGCAAG	3600
15	TAAATCTATA ACTTCTTGTT CTTTAATTGG TTCCAACAG TTCACTCCTT ACACTATCAA	3660
	TGTGTTTATC TTTCTATTTT ACTAAAACT ATTCGATAAT TGTATACGAT TGCTCAATTA	3720
	TTTATAAATT AATTTTCATG AAGGGTAATT ACTCAGGATT ACGTAATCAT ACAGCATTAG	3780
20	TTTTTTACTT TTA AAAATCA AAAATTGTT GGAATTGAA AAGTGTTAAA CATTAAAAAT	3840
	GATGCTATAT TAATGGTGTA TGAATGAATT CATAAGTTTT TAAATGTAT TAAATTTGTG	3900
	GAGGCATGTA AACAATGAAA GTATTAACT TAGGATCGAA AAAACAAGCA TCATTCTATG	3960
25	TTGCATGTGA GTTATATAAA GAGATGGCAT TTAATCAGCA CTGTAAACTA GGTTTAGCAA	4020
	CTGGTGGTAC AATGACAGAT TTGTATGAAC AACTTGTTAA GTTGTTAAAT AAAATCAGT	4080
30	TAAACGTAGA CAATGTATCC ACGTTTAATT TAGACGAATA TGTAGGTTTA ACCGCATCAC	4140
	ATCCGCAAAG TTATCACTAT TATATGGATG ACATGCTTTT CAAACAATAT CCTTATTTTA	4200
	ATAGAAAGAA CATTCATATT CCAATGGAG ATGCCGATGA TATGAATGCG GAAGCGTgCA	4260
35	AAATATAATG ACGTTTLAGA ACAACAAGGT CAACGTGATA TTCAAATTTT AGGTATTGGT	4320
	GAAAATGGTC ATATTGGATT TAATGAACCT GGTACGCCGT TTGATAGCGT TACTCATATC	4380
	GTTGATTTGA CTGAAaGTAC TATTAAGGCT AATAGTCGAT ATTTTAAAAA CGAaGATGAT	4440
40	GTTCCAAAGC AAGCCATTTC GATGGGACTT GCTAATATTC TTCAAGCCAA ACGTATCATT	4500
	TTACTCGCAT TTGGTGAAAA GAAACGTGCT GCTATTACAC ATTTATTAAA TCAGGAAATT	4560
	TCTGTTGATG TTCCAGCCAC ATTACTTCAC AAACACCCGA ATGTTGAGAT ATATTTAGAC	4620
45	GACGAAGCTT GCCCCAAAAA TGTTCGCAAA ATTCATGTG ATGAAATGGA TTGATTGCAA	4680
	TGTTTAATTA AGAAATGCCT CGGGAAAGGT TCCAATAGAA AGATAAAAAG CATTGGAAGG	4740
50	ATGATTTTTA GTGGAATTAC AATTAGCAAT TGATTTATTA AACAAAGAAG ACGCGGCTGA	4800
	GTTAGCAAAT AAAGTAAAAG ATTATGTAGA TATCGTAGAA ATCGGTACGC CAATCATTTA	4860
	CAACGaAGGT TTACCAGCAG TTAAACATAT GGCAGACAAC ATTAGTAATG TAAAAGTATT	4920

55

	CGCGGATGTA ATTACAATAC TAGGTGTTGC AGAAGATGCA TCAATTAAAG CAGCTATTGA	5040
	AGAAGCTCAT AAAAATAATA AACAATTACT AGTTGATATG ATTGCTGTTT AAGATTTAGA	5100
5	AAAACGTGCA AAAGAACTAG ATGAAATGGG TGCTGATTAT ATTGCAGTAC AACTGTTT	5160
	TGATTTACAA GCAGAAGGGC AATCACCATT AGAAAGTTTA AGAACCGTTA AATCTGTTAT	5220
	TAAAAATTCT AAAGTTGCAG TAGCAGGTGG AATTAAACCA GATACAATTA AAGATATTGT	5280
10	CGCTGAAAGT CCTGATCTTG TTATTGTTGG TGGCGGAATC GCAAATGCAG ATGATCCAGT	5340
	AGAAGCTGCG AAACAATGTC GCGCTGCAAT CGAAGGTAAG TAATATGGCT AAATTTAGTG	5400
15	ACTATCAATT AATTCTAGAT GAATTAAAGA TGACTTTGTC ACATGTTGAA GCGGATGAGT	5460
	TTTCACTTT TGCATCCAAA ATACTACATG CTGAACATAT ATTTGTAGCT GGCAAAGGAC	5520
	GTTTCAGGATT CGTGGCGAAT AGTTTTCGAA TGCGCTTAAA TCAGCTCGGC AAACAGGCAC	5580
20	ATGTTGTTGG AGAATCAACG ACACCTGCGA TTAAGTCGAA TGATGTATTT GTAATTATCT	5640
	CTGGTTCAGG TTCCACGGAA CATTAAAGAT TATTAGCAGA CAAAGCAAAA TCAGTAGGTG	5700
	CTGACATCGT ATTAATTACT ACAAATAAAG ATTCTGCAAT AGGCAATCTA GCTGGGACGA	5760
25	ACATCGTTTT GCCTGCAGGT ACAAATATG ATGAACAAGG CTCGGCACAA CCATTAGGAA	5820
	GTTTGTGTTGA ACAAGCATCT CAATTATTTT TAGATAGTGT TGTAAATGGA TTGATGACTG	5880
	AAATGAATGT TACGGAACAA ACGATGCAAC AAAATCATGC TAATTTAGAA TAAATAAAG	5940
30	ATAGTCGATA ATATGATGCC TAGGCAGAAA TATTATCGAT TATTTTTTTA TTAAATAAT	6000
	AAATTATAGT ATAATATCAA TAATAACGA ATAGGGGTGT TAATATTGAA GTTTGACAAT	6060
35	TATATTTTTG ATTTTGATGG TACGTTGGCA GACACGAAA AATGTGGTGA AGTAGCAACA	6120
	CAAAGTGCAT TTAAAGCATG TGGCTTAACG GAACCATCAT CTAAAGAAAT AACGCATTAT	6180
	ATGGGAATAC CTATTGAAGA ATCATTTTTA AAATTAGCAG ACCGACCATT AGATGAAGCA	6240
40	GCATTAGCAA AGTTAATCGA TACATTTAGA CATACATATC AATCTATTGA AAAGGACTAT	6300
	ATTTATGAAT TTGCGGGTAT AACTGAAGCC ATTACAAGTT TGTATAACCA AGGGAAAAAA	6360
	CTTTTCGTGG TGTCTAGTAA GAAGAGTGAT GTATTAGAAA GAAATTTATC GGCTATTGGA	6420
45	TTAAATCACT TGATTACCGA AGCTGTTGGA TCCGATCAAG TAAGTGCATA TAAACCAAAT	6480
	CCTGAAGGCA TACACACAAT TGTGCAACGC TACAATTTAA ATAGCCAACA AACGGTGTAT	6540
50	ATTGGTGATT CAACGTTTGA TGTGAGATG GCACAACGTG CTGGTATGCA ATCTGCAGCT	6600
	GTCACCTGGG GTGCACATGA TGCAAGGTCA TTAATTTCATT CAAATCCGGA TTTTATTATT	6660
	AATGATCCAT CAGAAATTAA TACCGTATTA TAAACTTGT TAAACAGAG AATACCATGG	6720

55

	ATTTAAAATA AATATTTATT AAACATTATG AATTTTTTAAA GAGTAATGTC TGA CTCTGTTG	6840
	ATAATTTATT TTTGTAAAAA TAAATTAAAG TAATGACAAA GTTATTGAAG TAAATTGAGT	6900
5	ATAAACATTT AAATACGATG TCGAAAAATGG CGATAGCATA TCACTTACAT GAAGTTGTGT	6960
	GctATCGCTA TTTTtagTTA TAATTCCAAA AAGTTAATCG TTCGATGATT TAAGAATTAT	7020
10	TATTGTTTAA TTCAAATGTA TGAGGGTATA AAATCATTGA ATTTAATTCTG ATAAAGCGAA	7080
	ATTTTTGAAC AAACATACTT TTGTATTTAT ATAAAAGTTT AAATTCTTAT AAATTTGACA	7140
	AAACTAATTA ACTCCGTATA ATTATGAAAC ATACAAGAGG GAGTGTATGA ATTCATGGAT	7200
15	TTTAATAAAG AGAATATTAA CATGGTGGAT GCAAAGAAAG CTAAAAAAC CGTTGTTGCA	7260
	ACCGGTATCG GTAATGCAAT GGAATGGTTC GATTTTGGTG TCTATGCATA TACA ACTGCG	7320
	TACATTGGAG CGA ACTTCTT CTCTCCAGTA GAGAATGCAG ACATTGACA AATGTTGACT	7380
20	TTCGCAGCAT TAGCCATTGC GTTTTtATTA AGACCAATTG GTGGTGTCTG ATTGGTATT	7440
	ATTGGTGACA AATATGGACG TAAAGTTGTA TTAACATCTA CAATTATTTT AATGGCATT	7500
	TCAACATTAA CCATTGGATT ATTGCCAAGC TATGATCAAA TTGGACTTTG GGCACCAATA	7560
25	CTATTATTGC TTGCAAGAGT ACTACAAGGG TTTTCAACAG GTGGAGAGTA TGCGGGGGCA	7620
	ATGACATATG TTGCCGAATC ATCTCCAGAT AAGCGTCGTA ACTCATTAGG TAGTGACTA	7680
30	GAAATTGGGA CATTATCAGG TTACATAGCT GCTTCAATTA TGATTGCTGT ATTAACATTC	7740
	TTTTTAACAG ATGAACAAAT GGCATCATTT GGTGGAGAA TCCCATTCTT ACTCGGTTTA	7800
	TTCTAGGAT TATTCGGCTT ATATTTACGT CGTAAGCTGG AAGAATCACC AGTTTTCGAA	7860
35	AATGATGTTG CAACACAACC AGAAAGAGAT AACATTAACT TTTTACAAAT CATCAGATTT	7920
	TATTACAAAG ATATATTTGT ATGTTTTGTA GCTGTTGTAT TCTTcaATGT TACAACTAT	7980
	ATGGTAACTG CATATTTACC AACCTATTTA GAACAAGTTA TTAAATTAGA TGCAACGACA	8040
40	ACAAGTGTAT TAATTACTTG TGTCATGGCA ATAATGATTC CATTAGCATT AATGTTTGGT	8100
	AAGTTAGCGG ATAAAATAGG TGAAAAGAAA GTATTTCTAA TTGGTACTGG TGGGCTAACA	8160
45	TTATTCAGTA TCATCGCATT TATGTTATTA CATTACAAT CATTTGTTGT AATAGTAATC	8220
	GGTATATTTA TATTAGGATT TTTCTTATCA ACTTACGAAG CGACAATGCC AGGGTCGTTA	8280
	CCAACGATGT TTTACAGTCA TATAAGATAT CGA ACTTTAT CAGTAACATT TAATATCTCT	8340
50	GTTTCGATAT TTGGTGGTAc GaCGCCATTA GTkGCaMcaT GGTTaGTTAC GAAA ACTGGA	8400
	GATCCATTAG CmCCTGCGTA TTATTTAACA GCAATCAGTG TTATTGGCTT TTTAGTTATT	8460
55	ACATTCTTAC ATTTAAGTAC AGCAGGAAAA TCTCTAAAAG GTTCGTATCC AAATGTAGAT	8520

EP 0 786 519 A2

	GAACGTAAGA	ATTAGAGATT	TTAATaAAAA	GTATAAATCA	ATCGTATATA	AGCACTTTAA	8640
	AGCTAGTAGG	TTCTGCTAAC	TTTAAAGTGC	TTTTTAAATT	GAGAACTGTA	ATTAGCCGTA	8700
5	ATAAAGTTTT	TGTATATACA	TAAACCCCCA	CTGCAATGAT	TATCGCAATG	GGGGAAAGAG	8760
	GGGACTTAAA	GCATATGTTT	AGCTTTGAAT	ACTTAAAATT	CTCTTGCTAT	TGAAATGTTA	8820
	GGATGTAAAT	ATGTCTTAGA	GTATTTTGTC	CAACGCAATT	AATATTGAGA	CTCTAACCTT	8880
10	CAATATTATT	ATAGAGAACA	CAAACCTAAA	TAGATTGGGT	GACTTATTTG	TGTCAGTTAT	8940
	TGCGATTGCG	ATAACTTCCT	TTCTCTATAT	ACATATAGTA	ACGTCTTATC	TAATAAAAAA	9000
	CATGGTACTA	CAGTATCAAA	TTTATCTAGG	GCTTAAAGTTT	GATTTTATA	ATAGGCAGGT	9060
15	TTACCTGATA	AAAATACTTA	TTCATTATAT	AATGTTAACA	ATATGTATTT	TAAAGTTTAC	9120
	ATTGAGTGAG	GGATATTGAT	GAACGTAATT	TTAGAACAGT	TGAAAACACA	TACTCAAAT	9180
20	AAACCTAATG	ACATAGCATT	ACATATCGAT	GATGAAACAA	TTACATATAG	TCAACTAAAT	9240
	GCCCCGATCA	CTAGCGCagT	TGAATCTTTG	CAGAAATATT	CACTTAACCC	TGTCGTTGCT	9300
	ATTAAATATGA	AATCACCGGT	GCAAAGTATT	ATTTGTTATT	TAGCTTTGCA	TCGTTTACAT	9360
25	AAAGTGCCTA	TGATGATGGA	AGGTAAATGG	CAAAGTACTA	TACATCGTCA	ATTGATTGAA	9420
	AAATATGGTA	TAAAGATGT	AATTGGAGAT	ACAGGTCTCA	TGCAGAATAT	AGACTCACCG	9480
	ATGTTTATTG	ATTCAACGCA	ATTACAGCAC	TACCCCAATT	TATTACATAT	TGGTTTTACT	9540
30	TCAGGGACAA	CTGGACTGCC	AAAAGCATAT	TATCGTGATG	AAGATTCATG	GTTGGCTTCT	9600
	TTTGAAGTTA	ATGAAATGTT	GATGTTAAAA	AATGAAAATG	CAATAGCAGC	CCCTGGACCA	9660
35	CTATCGCACT	CGTTAACATT	ATATGCGTTA	TTGTTTGCTT	TAAGTTCCGG	TCGTACTTTT	9720
	ATAGGACAGA	CCACTTTTCA	TCCTGAAAAG	TTACTTAATC	AATGTCATAA	AATATCATCA	9780
	TACAAGTTG	CTATGTTTCT	TGTTCCAACG	ATGATTAAAT	CATTATTGTT	AGTTTACAAC	9840
40	AATGAACATA	CAATCCAATC	ATTTTTTAGC	AGTGGAGATA	AGCTGCATTG	TTCTATTTTT	9900
	AAAAAGATAA	AAAATCAAGC	AAATGACATA	AATTTGATTG	AATTTTTTGG	TACATCGGAA	9960
	ACCAGTTTTA	TCAGCTATAA	CTTGAATCAG	CAAGCACCAG	TTGAATCAGT	AGGTGTGCTA	10020
45	TTTCCAAATG	TGGAATTGAA	AACAACGAAT	CACGATCACA	ATGGTATAGG	AACTATTTGT	10080
	ATAAAAAGTA	ATATGATGTT	TAGTGGCTAT	GTAAGTGAAC	AATGTATAAA	TAATGATGAA	10140
	TGGTTTGTTA	CTAATGATAA	TGGCTATGTA	AAAGAGCAGT	ATTTATATTT	AACGGGACGT	10200
50	CAACAGGATA	TGTTAATTAT	TGGTGGTCAA	AATATATATC	CAGCACATGT	TGAACGCCTT	10260
	TTAACGCAAT	CTTCGAGCAT	TGATGAAGCA	ATTATCATCG	GTATTCCAAA	TGAGCGTTTT	10320
55							

	CAATTTTAA AAAAGAAAGT GAAaCgnTaT GAAATTCCAT CGATGATTCA TCATGTAGAA	10440
	AAGATGTATT ACACTGCAAG tGGTaAAATT GCTAGAGAAA AAATGATGTC GATGTATTTG	10500
5	AGAGGTGAAT TATAATATGA ATCAAGCAGT CATAGTTGCA GCTAAACGAA CTGCATTTGG	10560
	GAAATATGGT GGCACTTTAA AACATTTAGA GCCaGAACAA TTGCTTAAAC CTTTATTCCA	10620
	ACATTTTAAA GAGAAGTATC CAGAGGTAAT ATCTAAAATA GATGATGTAG TTTTAGGTAA	10680
10	TGTTGTTGGG AATGGTGGCA ATATTGCAAG AAAAGCATTG CTTGAAGCGG GGCTTAAAGA	10740
	TTCAATACCT GGCCTCACA TCGATCGGCA ATGTGGGTCT GGACTTGAAA GTGTTCAATA	10800
	TGCATGTCGC ATGATCCAAG CCGGAGCTGG CAAGGTATAT ATTGCAGGTG GTGTTGAAAG	10860
15	TACAAGTCGA GCACCTTGGA AAATCAAACG ACCGCATTCT GTGTACGAAA CAGCATTACC	10920
	TGAGTTTTAT GAGCGTGCAT CATTGTCACC TGAAATGAGC GACCCATCAA TGATTCAAGG	10980
20	TGCTGAAAAT GTGGCCAAGA TGTATGATGT TTCAAGAGAA TTACAAGATG AATTTGCTTA	11040
	TCGAAGTCAT CAATTGACAG CGGAAAATGT AAAGAATGGA AATATTTCTC AGGAAATATT	11100
	ACCTATAACC GTTAAAGGAG AAATATTCAA CACTGATGAA AGTCTAAAAT CACATATTCC	11160
25	GAAAGATAAC TTTGGCCGAT TTAAGCCCGT GATCAAAGGT GGGACCGTTA CCGCTGCGAA	11220
	TAGTTGTATG AAAAATGATG GTGCAGTTTT ATTGCTTATT ATGGAAAAG ATATGGCATA	11280
	CGAATTAGGT TTCGAGCATG GTTTATTATT TAAAGATGGT GTTACGGTAG GTGTTGATTG	11340
30	TAATTTTCCT GGCATTGGTC CAGTACCAGC CATTCCAAC TTAATAAAAA GAAATCAATT	11400
	AACGATAGAA AATATTGAAG TCATTGAAAT TAACGAAGCG TTCAGTGCAC AGGTAGTTGC	11460
	CTGCCAACAA GCTTTAAATA TTTCAAATAC GCAATTAAAT ATATGGGGTG GTGCATTAGC	11520
35	ATCAGGTCAT CCATACGGTG CAAGCGGTGC CCAATTAGTG ACTCGATTAT TTTATATGTT	11580
	TGACAAAGAG ACTATGATTG CATCTATGGG GATAGGGGGA GGTCTAGGAA ATGCAGCATT	11640
40	ATTTACTCGA TTCTAACCAG CGATTAAATG TGTCATTTTC TAAGGATAGT GTGGCTGCAT	11700
	ATTATCAGTG TTTTAACCAA CCTTATAGAA AAGAAGTACC ACCATTAATG TGTGCGTCAT	11760
	TATGGCCAAA ATTTGATTTA TTTAAAAAAT ATGCAAATAG CGAACTGATT TTAACAAAAT	11820
45	CAGCAATTAA TCAAACTCAA AAGATAGAAG TAGACACAAT ATATGTAGGG CATTTAGAAG	11880
	ATATTGAATG CCGACAGACT CGCAATATCA CACGTTATAC AATGGCTTTA ACATTAACCTA	11940
	AAAATGATCA ACATGTCATA ACGGTtACAC AAACTTTTAT TAAGGCGATG AAGTAGAGAT	12000
50	GGAGTTTAAT GAGATATGGA TAAATGAATA TTTGGCGCTC GTAAATGATG ATAATCCAAT	12060
	ACATAATGAG ATTGTCAGG GACAATTAGT GAGTCAAATG ATGCTGATGG CTATGTCATT	12120
55		

EP 0 786 519 A2

5
 10
 15
 20
 25
 30
 35
 40
 45
 50
 55

ATTCATTGAA CAACACGAAC ACGAAATTAT AGCAATTAAT GACGATGGAG AGATTAAAT 12240
 AAAAATTTCT TTGAGCACAA AAAAATAACC GATATTAGCT GCATGAACGC ATATTAATTA 12300
 GGAGATGAAA GGACAGCTAA TATCAGTTAT GTATTGTTAT TATTATTGGG AACAGAGATG 12360
 AATATAGGTT ACGTTTCTTT CTTTGCACGG GGATGCATTA ATCTAAAATA ATAATAACAA 12420
 CTATATCAAT GTTTAATAAA TTCTGGATTA TTGGAACGAT TAGTCAATTT AACTAACTTT 12480
 CATATGATCT ATATCGTCTT GTAATAAAGA GAGCAATTTG AATATTTTCTAG TATCACTAAA 12540
 TGAATCGTCA CATTTAATTG AAACATGCTG AAACGTTTTG GTTATAATTT CATAAACTGG 12600
 TGCGCCTTCA TGGTGATACT GTCGATAAAT AATCATAACC TATATTACCT CCTTTGCTAC 12660
 TCTATGGTTA TATTATAAAT AACATTTTTA TGTGTGACAT CAACCTTAAG TATCAACTTT 12720
 TTATCAGACA TAGAACGTAT GATTTACTAA GACTATTTAT GTATAAAAAGT TCTAAATAAA 12780
 TATATATTTA TAGAGTCGCC TGGCAGTCAT TTGGGAATA TAACATATAT GATTAGAGAG 12840
 GCATCTATCG CAAAAGAATG ATAATGATAG AGGTATTGAG CATATAGATG AGTTTAAGTT 12900
 CATCTTGAAA ATAAAGGGTT ATTTAGTCAT AGATGTAGAT GTATAGGAAA TATTTGTATG 12960
 TATTGTTTGA TATGTATGAA ATTTTCAATA AAAGCTAATA ACGCTTATAT GTAACTTTCA 13020
 AATTTAAATT ATATACAGAG CATGATGATT ATAAAAAAT AACCACATCA CATAAATTGA 13080
 GTTCATACCC AATTTAAGTG GTGTGGCTAA TAATGTTGAT TTATAGATGA ACCGCCTAAT 13140
 CGTTAAACCT CTGTTACTTC AACATCGATA TGTTCATAC GGTGTATGC ACCGTGATCC 13200
 ACAGGACCAA CAAATCATT CATTTTCCAA CCGTTTTTAA TAGCAGAAGC GACGAAAGCT 13260
 TTCGCGCTAA TCACAGCTTC TTTCCGTGAC TTACCGTTAG CTAAATATGC AGTTGTTGCC 13320
 GCAGCAAATG TACAACCAGC ACCATGGTTA TAACTTTGTT GGAACATGTC TGTGTTAGT 13380
 TGATAAAATG TTGACCATC ATAGTATAAG TCATACGATT TATCTTGATC TAAAGCTTTG 13440
 CCACCTTTAA TGATGACATG CTGTGCGCCT TTATCAAAGA TAATTGTTGC AGCCTTTTTT 13500
 ATATCTTCAA TTGAATTTAA TTTACCTAAT CCTGATAATT GACCCGCTTC AAATAAGTTT 13560
 GGTGTCACTA CCGTTGCTTT AGGTAGTAAA TATTTAATCA TCGCCTCAGT ATTTCCAGGA 13620
 TTAAGCACTT CATCTTCGCC TTTACAAACC ATGACAGGAT CTACTACAA ATATTGTGCA 13680
 TTAGATGCCT CATATACTTC TCCAGCACGT TTGATTATCT CCTCAGTACC TAACATACCT 13740
 GTTTTAATAG CATCAGGTCC GATTGATAAA GCCGTTTCAA GTTGTTTTTC AAATACATCC 13800
 ATTGGTAATG GTGTAACATC GTGTGACCAT GTATCTTTAT CCATAGTAAC GATGGCAGTT 13860
 AAAGCGACCA TGCCATACGT ATCTAATTCT TGGAACGTTT TCAAATCTGC TTGCATACCT 13920

EP 0 786 519 A2

CACTCCTACA TAATAATATT GTATTCATCA TATCATTTTT AACCTAATTG AAAAATATTA 14040
 AGCATTCAAT ATTTGATGAT TGTGAAATG AATCATTCACT ACTATTGTAA CTTTGTAAAA 14100
 5 TGTCAATTCAC TTTAGATAAG TGTGATATGT TAAAATATGT CCTGAGGTGA GATTGAATGG 14160
 AATGGTCCGA AATTTTTTCAT GACATAACAA CGAAACATGA CTTTAAAGCT ATGCATGATT 14220
 TTTTAGAAAA AGAATATTCG ACTGCAATCG TATACCCTGA TAGGGAAAAT ATATATCAAG 14280
 10 CGTTTGATTT AACACCGTTT GAAAATATCA AAGTTGTTAT ATTAGGACAA GACCCGTATC 14340
 ATGGTCCAAA CCAAGCACAT GGATTAGCAT TTTCACTGCA ACCTAACGCA AAATTCCCTC 14400
 CATCTTTACG TAATATGTAT AAAGAATTAG CAGATGATAT TGGATGCGTT AGACAAACAC 14460
 CGCATTTACA AGATTGGGCA AGAGAAGGCG TCTTGTATT GAATACAGTT TTAACCGTAA 14520
 GACAGGGTGA AGCAAATTCT CATCGTGATA TTGGTTGGGA AACATTTACT GATGAAATTA 14580
 20 TTAAAGCAGT GTCTGATTAT AAAGAACATG TTGTCTTTAT TTTGTGGGGG AAACCTGCAC 14640
 AGCAAAAAAT AAAGCTTATC GATACATCTA AACATTGTAT TATAAAATCA GTGCATCCTA 14700
 GTCCACTGTC TGCATATAGA GGATTCTTTG GATCAAAACC GTATTCCAAA GCGAATGCCT 14760
 25 ATTTAGAGTC AGTAGGAAAA TCACCAATTA ATTGGTGTGA AAGTGAGGCG TAGATGTTGA 14820
 ATAGAGAAAC TTTAATAGCA CGAATTGAGC AAGAATTAGT ACAAGCAGAG CAGGCACAGC 14880
 ATGACCATGA CTTTGAAAAA CATATGTATG CCATACATAT ATTAACATCT TTATATGCTT 14940
 30 CAACATCAAA TACACCACAT ATTGGTGAAC AACAAATGAA TCGTCGTATT GCTAACCAT 15000
 ATCAAATGCC ACAATCACAA ATAACGCAGC CAACTCATCA AGTGACAGTT GCTGAAATTG 15060
 AAGCGATGGG TGGTAAAGTA AATACGCATT CAGCACATCA TCATAATAAG TCATATTCAC 15120
 35 AACCTTCAAA CCAACAACAA AGATTAGCGA CAGATGATGA CATTGGCAAT GGTGAATCCA 15180
 TATTGATTT TTAAAAAGCA ACAATGAAAC ATAATTACTT AATAGCTTGT TAAGTATGTA 15240
 40 GGTAAATAAT CAAGACGCAT ATACTTTTAT TCGAGTGTTC GGATTTAAAC ATTTATTAAT 15300
 ACTGAATTAT ATAAGGAGAG GTAGCAATGA AATTATTTAT TATTTTAGGT GCATTAAACG 15360
 CGATGATGGC TGTCGGTACA GGTGCATTG GTGCGCATGG TTTACAAGGA AAAATAAGTG 15420
 45 ATCACTATTT ATCAGTATGG GAAAAAGCAA CGACGTATCA AATGTACCAT GGCTTAGCAT 15480
 TATTAATTAT AGGTGTAATT AGTGGTACAA CTTCAATCAA TGTTAACTGG GCTGGCTGGT 15540
 TAATATTTGC TGGTATTATT TTCTTTAGTG GATCATTATA TATTTTAGTA TTAACCTCAA 15600
 50 TTAAAGTTTT AGGTGCGATT ACGCCAATTG GTGGCGTATT GTTCATCATT GGATGGATAA 15660
 TGTTAATCAT TGCACATTC AAATTGCTG GTTAAATTT AAAACTTTAG ATTACCTATG 15720

55

TGGGTATAGA ATACCTTCGA GGTGAGTTTT TATTTATGGA AAAAAAGAAT AAGCAAATAG 15840
 ATAGAGGCCGA TTAAAAACAA AACCTATCTG AAAAGTTTGT ATGGGCGATT GCATATGGTT 15900
 5 CATGTATCGG ATGGGGCGCA TTCATCTTAC CAGGAGACTG GATTAAGCAG TCAGGTCCGA 15960
 TTGCAGCATC AATTGGTATA GTTATTGGTG CATTATTAAT GATATTAATT GCGGTTAGTT 16020
 ATGGCGCATT AGTAGAGAGA TTTCCAGTAT CAGGGGGCGC GTTTGCCTTT AGTTTCTTAA 16080
 10 GTTTCGGCAG ATATGTGAGT TTCTTCTCAT CATGGTTTTT AACTTTTGGT TATGTCTGTG 16140
 TCGTTGCTTT AAAtGCGACC GCATTCAGTT TACTAGTTAA ATTCTTATTG CCAGATGTCT 16200
 TAAATAATGG GAACTATAC ACCATTGCGG GCTGGGACGT TTATATTACG GAAATCATTa 16260
 15 TTGCGACCGT ATTACTACTT GTATTCATGC TAGTAACGAT TCGTGGCGCA AGTGTATCTG 16320
 GATCATTACA ATATTATTTT TGTGTGGCGA TGGTAATCGT CGTATTATTG ATGTTCTTTG 16380
 20 GTTCATTCTT TGGTAATAAT TTTGCACTTG AAAATTTACA ACCGTTAGCT GAACCTAGCA 16440
 AAGGATGGTT AGTGTCTATT GTGGTTATTG TATCCGTGGC ACCATGGGCA TATGTTGGAT 16500
 TTGATAATAT TCCACAAACA GCAGAAGAGT TTAACTTTGC ACCAAACAAG ACATTTAAGC 16560
 25 TTATCGTGTA CAGTTTATTA GCAGCATCAT TAACTTATGT TGTGATGATT TTATACACTG 16620
 GTTGGTTATC AACAAGTCAT CAAAGTTTAA ATGGGCAGTT GTGGTTAACA GGTGCTGtTA 16680
 CACAAACAGC ATTTGGTTAT ATTGGATTAG GTGTATTAGC AATTGCAATT ATGATGGGTA 16740
 30 TATTTACTGG TTAAATGGA TTCTTGATGA GTTCAAGTCG CTTGTTATTT TCTATGGGAC 16800
 GTTCAGGTAT TATGCCAACA ATGTTTAGTA AATTACATAG TAAATACAAA ACACCATATG 16860
 TCGCAATCAT ATTCCTAGTA GGAGTGTCGT TAATTGCACC TTGGCTAGGA AGAACTGCAT 16920
 35 TGA CTGGAT TGTAGATATG TCATCTACTG GTGTATCCAT TGCCTACTTT ATTACATGTT 16980
 TGTCTGCAGC GAAATTATTC AGTTATAACA AACAAAGTAA TACGTATGCA CCGGTTTACA 17040
 40 AAACGTTTGC TATTATCGGC TCATTTGTAT CATTCATTTT CTTAGCGTTG TTATTAGTGC 17100
 CAGGTTCTCC TGCAGCACTG ACTGCACCGT CTTATATTGC ATTACTTGGa TGGTTAATCA 17160
 TCGGTTTAAT ATTCTTTGTG ATTCGATATC CTAAATTGAA AAATATGGAT AATGATGAAT 17220
 45 TAAGTCGCTT GATTTTAAAT AGAAGTGAAA ATGAAGTTGA TGATATGATT GAAGAACCTG 17280
 AAAAAAGAAA AACTAAATAA TAAAAGAATC GCACAATAAA CCTTCTTCAT TCGGAGGCGT 17340
 ATCGTGCGAT TTTTGTATT ATAAATTGAC ATTTAAGACG AGGCAGCTGA ACCTTATATA 17400
 50 TAATTGCTAA GAGTTAGGGC TGAGCCATTT CTAACAAATA TTTATAATCG TTTAAAAGAT 17460
 TTCACGAACC CAGAAACAAT TAATTGGAA ATTTGGTCGG CGAATAATAA ACCTAATGCG 17520

55

AAGACTAAAT TTTTGTAGC ATCGTATGCT AAGCCACCAG GTACTAATGG AATGATACCC 17640
 GTTACCATAA AAATGATGGC AGGTTCTTTT TGTTTACGAG CCATATAATG ACTTAACAAG 17700
 5 CCTAATGCTA AACTACCAAA GAACTAGAG TATATAGTGT GCACATTAAA GCCGTTGAAG 17760
 AATAAGGTGT AAACCATCCA TCCACACGTA CCAACGAAAC CACATGATAG ATATAATTTT 17820
 CTAGGTGCAT CAAAATGAC GCAGAA 17846

(2) INFORMATION FOR SEQ ID NO: 110:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 5544 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 110:

ATTGACACTT GGTGAAAGTA ATATCGCCGC GCTATTTTGG CAAAATGGAC ACTTAGAACC 60
 TGAGTTACAA GATGAACAGC CAATTAATAT ATTAGGATCT GkTCAAATCA ACGAATGGAA 120
 25 TGGTAATCAA TCACCGCAA TAATTATTCA AGATATTGCG ATGAATGAAC AGCAAATATT 180
 AGATTATAGA AGTAAGCGAA AAAGTTTACC TTTTACAGAA AATGATGAAA ATATTGTCGT 240
 GCTTATTCAT CCTAAAAGTG ATAAAGTAAA TGCGAATGAA TATTATTATG GTGAAGAAAT 300
 30 TAAACAACAA ACTGATAAAG TAGTATTAAG AGATTTACCA ACGTCAATGG AAGACTTGTC 360
 TAATTCCTTG CAACAACGTC AATTTTCTCA ACTTTATATA GTTTTGCAAC ATAATCATTC 420
 GATTTACTTC GATGGTATAC CTAATATGGA TATTTTAA AAGTGTATA AAGCATTAAAT 480
 35 AACTAAACAA GAAACAAATA TCCAGAAAGA GGGTATGTTA TTGTGTCAAC ATTTAAGTGT 540
 GAAACAGAT AACTTAAAT TCATGTTGAA AGTTTTCTTA GACTTAAAT TTGTAACACA 600
 40 AGAAGATGGT TTAATTGCGA TCAATCAACA ACCTGATAAA AGATCGATTG ATTCCAGCAA 660
 AGTATATCAA TTAAGACAAC AACGTATGGA TGTGAAAAG CAATTATTAT ATCAAGATTT 720
 TTCAGAAATA AAAAATTGGA TAAAGTCACA ATTGTCGTGA GCAATTTAGG AGGAAATATT 780
 45 AATGGATTTA AAGCAATACG TATCAGAAGT TCAAGATTGG CCGAAACCAG GTGTTAGTTT 840
 CAAGGATATT ACTACAATTA TGGATAATGG TGAAGCATAT GGCTATGCAA CAGATAAAAT 900
 TGTAGAATAC GCAAAAGACA GAGATGTTGA TATCGTTGTA GGACCTGAAG CGCGTGGCTT 960
 50 TATCATTGGC TGTCTGTAG CTTATTCAAT GGGGATTGGC TTTGCACCTG TTAGAAAAGA 1020
 AGGGAAATTA CCTCGTmAG TCATTGTTA TGAGTATGAC CTAGAATATG GTACAAATGT 1080

EP 0 786 519 A2

	ATTAGCTACT GGTGGTACGA TTGAAGCAGC AATAAAATTA GTTGAAAAAT TAGGCGGTAT	1200
	CGTAGTAGGT ATTGCATTTA TAATTGAATT GAAATATTTA AATGGTATTG AAAAAATTAA	1260
5	AGATTACGAT GTTATGAGTT TAATCTCATA CGACGAATAA TAAATAATAT AATTTTATCA	1320
	AATGAAATCC TTCATCAAAT GTATAAGAAC CAATGACTTA ATTAAAAAAG TTGTTTAAGT	1380
10	TTTCTTAACA TGAGATGTTA GGATTTTTTA TTTACTGAAA ATGTTAGATG ATTGAGCATT	1440
	ATACCTTAAT AACATCGTTT ATTTATTTC AATAATTGTAG TATCATAGAA CTAATATTTA	1500
	AAAAATGAAA CAGTAGATT AGGTCGAATT TTTGTAAAAG TTTTAAAAGT AGGAATAGTA	1560
15	TACAAATTAA ACTCGCTCAA GTAAAATTAA TATTACGATT AATGACGACA GGATAAATAT	1620
	TTATCGTCGA CGGACGTATG ATTGGTGTGG GACAAATACT ATTCAACAAG AGTACCTAAA	1680
	TCATTGTTTA AGGCGAAGTA ATAAATATGA ATGGGGTGTA TCATATAATG AACACGAAT	1740
20	ATCCATATAG TGCAGACGAA tTCTTCACAA AGCAAAATCA TATTTGTCAG CAGATGAATA	1800
	TGAGTATGTT TTAAAAAGCT ATCATATTGC TTATGAAGCA CATAAAGGTC AGTTCCGAAA	1860
	AAACGGATTA CCATACATTA TGCATCCTAT ACAAGTTGCA GGTATTTTAA CAGAAATGCG	1920
25	ATTAGACGGA CCGACGATTG TCGCAGGTTT TTTGCATGAT GTAATTGAAG ATACACCGTA	1980
	TACATTTGAA GATGTAAAAG AAATGTTCAA TGAAGAAGTT GCTCGAATTG TTGATGGTGT	2040
	GACGAAGCTT AAAAAAGTAA AATACCGCTC AAAAGAAGAA CAACAAGCTG AAAATCATCG	2100
30	CAAGTTATTT ATTGCGATTG CCAAAGATGT ACGCGTAATT TTGGTGAAAT TAGCAGACAG	2160
	ATTACATAAT ATGCGTACCT TGAAAGCCAT GCCGCGCGAA AAACAAATTA GAATTTCTCG	2220
35	AGAAACATTA GAAATTTATG CACCATTAGC ACATCGTCTT GGTATTAATA CAATCAAATG	2280
	GGAAC TAGAA GATACGGCTC TTCGTTATAT TGATAATGTG CAATATTTTA GAATAGTCAA	2340
	TTTAATGAAG AAGAAACGTA GTGAACGTGA AGCGTATATC GAAACGGCTA TTGATAGAAT	2400
40	ACGTACTGAA ATGGACCGAA TGAATATCGA AGGCGATATA AATGGTAGAC CTAAACATAT	2460
	TTACAGTATT TATCGGAAAA TGATGAAGCA GAAAAACAA TTTGATCAA TTTTGTGATT	2520
	GTTGGCGATA CGTGTATTG TCAATTCTAT TAATGATTGT TATGCGATAC TTGGGTTGGT	2580
45	GCATACGTTA TGGAAACCGA TGCCAGGACG TTTTAAAGAT TATATTGCAA TGCCTAAACA	2640
	AAATTTGTAT CAGTCATTGC ATACTACAGT AGTAGCCCA AATGGAGACC CGCTCGAAAT	2700
	CCAAATACGA ACGTTTGATA TGCACGAAAT TGCTGAGCAT GGTGTTGCAG CACACTGGGC	2760
50	TTACAAAGAA GGTAAAAAAG TAAGTGAAAA AGATCAAAC TATCAAAATA AGTTAAATTG	2820
	GTTAAAAGAA TTAGCTGAAG CGGATCATAC ATCGTCTGAC GCTCAAGAAT TTATGGAAAC	2880

55

	TGAGTTGCCA TATGGTGCTG TGCCGATTGA TTTTGCTTAT GCGATTCACA GTGAAGTAGG	3000
	TAATAAGATG ATTGGTGCCA AGGTGAATGG CAAAATTGTA CCAATTGACT ATATTTTACA	3060
5	AACAGGCGAT ATTGTTGAAA TACGTACTAG TAAACATTCA TATGGACCAA GTCGTGATTG	3120
	GTTGAAAATT GTTAAATCGT CTAGTGCCAA AGGTAAAATT AAAAGTTTCT TCAAAAAACA	3180
	AGATCGTTCA TCTAATATTG AAAAAGGCCG AATGATGGTT GAAGCTGAAA TAAAAGAGCA	3240
10	AGGATTTAGA GTCGAAGATA TTTTGACAGA GAAAAATATT CAGGTTGTTA ATGAAAAATA	3300
	TAACTTTGCA AATGAAGATG ATTTATTTCG AGCTGTAGGA TTTGGCGGCG TGACATCCTT	3360
	ACAGATTGTT AATAAATTAA CTGAAAGACA ACGTATTTTA GATAACAAC GTGCTTTAAA	3420
15	TGAAGCACAA GAAGTTACGA AATCATTGCC TATTAAAGAC AACATCATTG CTGATAGTGG	3480
	TGTCTATGTA GAAGGTTTAG AAAATGTACT TATCAAGTTG TCAAAATGTT GTAATCCTAT	3540
20	ACCaGGTGAT GATATTGTAG GTTATATCAC CAAAGGTCAC GGTATTAAAG TACATCGCAC	3600
	TGATTGCCCA AATATTAAGA ACGAACTGA ACGACTAATT AATGTTGAAT GGGTAAATC	3660
	AAAAGACGCA ACTCAAAAT ATCAGGTTGA TTTAGAGGTA AtGCGTATGA CCGAAATGGC	3720
25	TTGTTGAATG AAGTACTACA AGCTGTTAGC TCGACAGCCG GCAATTTAAT TAAAGTTTCA	3780
	GGACGTTTCA ATATTGATAA AAATGCAATA ATAAATATTA GTGTCATGGT GAAAAACGTG	3840
	AATGATGTTT ATCGTGTGGT AGAAAAGATC AAACAACCTG GTGATGTTTA TACAGTAACA	3900
30	AGAGTTTGGG ACTAGAGGTG CAAAATATGA AAGTAGTTGT ACAAAGAGTT AAAGAAGCAT	3960
	CGGTGACGAA TGATACATTA AATAATCAAA TCAAAAAGG ATATTGTTTA TTAGTCGGTA	4020
	TCGGTCAGAA CTCTACAGAG CAAGATGCAG ATGTAATTGC AAAGAAAATT GCTAATGCAA	4080
35	GATTATTGTA AGATGACAAT AATAAATTAA ACTTTAATAT CCAACAAATG AATGGTGAAA	4140
	TACTATCAGT TTCACAATTT ACTCTCTATG CAGATGTAAA AAAAGGTAAC CGTCCAGGTT	4200
40	TCTCAAATTC TAAAAATCCT GATCaAGCGG TAAAAATTTA TGAGTATTTT AATGcaTGCG	4260
	CTACGAGCGT ATGGTCTTAC TGTGAAAACA GGTGAATTTG GAACACACAT GAATGTTAGC	4320
	ATAAATAATG ATGGTCCAGT CACTATTATT TATGAAAGTC AGGACGGCAA AATTCAATGA	4380
45	AAAAAATAGA GGCATGGTTA TCTAAAAAGG GTCTTAAAAA TAAACGTACT CTAATAGTAG	4440
	TGATTGCCTT TGTCTTATTT ATCATCTTTT TATTTTATT GCTGAATAGC AATAGTGAAG	4500
	ATAGTGGGAA CATCACGATA ACTGAAATG CTGAATTACG TACAGGTCCA AACGCTGCGT	4560
50	ATCCAGTCAT ATATAAGTT GAAAAAGGTG ACCATTTTAA AAAGATTGGT AAAGTAGGTA	4620
	AATGGATTGA AGTTGAAGAT ACATCCAGTA ATGAAAAAGG TTGGATAGCT GGATGGCACA	4680

55

TAGTGCTTGA TCCTGGTCAT GGAGGTAGTG ACCAGGGTGC TTCAAGCAAT ACTAAATATA 4800
 AAAGTTTGA AAAAGATTAT ACGTTGAAAA CAGCAAAAGA ATTGCAGCGT ACTTTAGAAA 4860
 5 AAGAAGGCGC AACTGTTAAG ATGACAAGAA CAGACGATAC ATATGTTTCA CTAGAAAATC 4920
 GTGATATCAA AGGCGATGCC TATTTGAGTA TACATAATGA TCGGTTAGAA TCATCTAATG 4980
 CAAATGGAAT GACaGTTTAT TGGTATCATG ATAATCAAAG AGCTTTAGCA GATACGTTAG 5040
 10 ACGCTACGAT TCAGAAGAAA GGTCTACTTT CTAATCGCGG TTCAAGACAA GAAAATTATC 5100
 AAGTGTTAAG ACAAACAAAA GTTCCTGCTG TTTTATTAGA ATTAGGTTAT ATTAGTAACC 5160
 CAACTGATGA AACGATGATT AAAGATCAAT TACATAGACA AATTTTAGAA CAAGCAATTG 5220
 15 TTGATGGCCT TAAATTTTAT TTTTCTGCGT AGGGCTTGCA AAAATATGTG AAAGTAGTTA 5280
 TCATTGATAT TGAATTTTAT AACTAAAACC GTTAGTATTC TTGAAATGGT AAATGAAATA 5340
 20 GGTAGCAATC TAACTAAGAT TGTGTAGGAA TATAATCCAT AGACTGAAAG ATTATGCTGA 5400
 GTAGTTTATA TACATTGAAC ACAAGAAGAG GTGCTTTATG AAAAGTAAAG CCGTTAAACG 5460
 TACGTTaAAC GTTTTGAGTG GGTATTATTA ATGCACGCTT ATAAAAAGTA ATGATGATTA 5520
 25 CAATTAGGCA TGTTTTTTAA ACCA 5544

(2) INFORMATION FOR SEQ ID NO: 111:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1067 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 111:

AAAAGATTGC AAATATAAAT GGCATGTTTA ATATGTTAGA ACAACAAATC ATTCATAGCC 60
 40 AAGATATGCG TCATTTTAGA AGTGAATTTT TTTACGTCAA TCATGaGCAT CGAGAAACT 120
 ATGAAGCACT CCTAATTTAT TACAAAAATA GTATCGACAA TCCTATTGTA GATGGTGCA 180
 GTTATATTTT AGCCCTACCT GAAATTTTCA ATAGTGTTGA TGTTTTCGAA TCAGAGTTAC 240
 45 CATTTCATG GGTATATGAT GAAATGGCA TTACCGAAAC AATGAAATCA CTTAGCATT 300
 CATTACAATA TTTAGTTGCA GCAGCTTTAG AAGTAACTGA TGTGAATATA TTTAAGCCTT 360
 CAGGATTTAC AATGGGAATG AATAATTGGA ATATTGCTCA AATGCGAATC TTTTGGCAAT 420
 50 ATACAGCAAT TATTAGAAAA GAAGCACTAT AACATTAATA ATTAATTAGC TATAAAGATG 480
 ATTCACAACA ATCATCTTTA TAGCTTTTTT ATGTCTAATT ATTTTGTAGG AAAATmACAA 540

AATTTTATGT TTTCAAAAGT AAACAATCAA AAGATGTTAG AAGATTGCTT CTATATAAGA 660
 AAGAAAGTGT TTGTAGAAGA ACAAGGCGTC CCTGAGGAAA GTGAAATTGA TGAATATGAA 720
 5 TCTGAATCTA TTCACCTCAT TGGATATGAT AATGGACAGC CAGTTGCCAC TGCTCGAATA 780
 CGCCCTATTA ATGAAACAAC TGTCAAATA GAACGAGTAG CTGTGATGAA ATCACATCGT 840
 GGACAAGGAA TGGGTAGAAT GCTTATGCAA GCTGTAGAAT CATTAGCTAA AGATGAAGGT 900
 10 TTTTACGTAG CTACTATGAA TGCCCAATGT CATGCTATCC CATTTTATGA AAGTTTAAAC 960
 TTTAAATGA GAGGTAATAT ATTTCTTGAG GAAGGCATCG AGCATATTGA AATGACAAAA 1020
 15 AAGTTAACCT CGCTTAATTA AAAAAAGTTG TATCTATTTT AGAAACA 1067

(2) INFORMATION FOR SEQ ID NO: 112:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 18613 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 112:

AAGACGtAtG ATAACAACAA TACgTGtAGT GAAAGATTTT AATCTACATA TTA CTGACAA 60
 AGAATTCATT GTATTTGTTG GACCATCGGG ATGTGGTAAA TCAACAACAT TACGAATGGT 120
 30 TGCTGGACTA GAGTCTATCA CATCTGGAGA TTTTATATT GATGGGGAAC GCATGAACGA 180
 TGTGAACCA AAGAATAGAG ATATTGCGAT GGTATTTCAA AACTATGCAT TATATCCACA 240
 TATGACTGTT TTTGAAAATA TGGCATTG GCTAAAGCTA CGTAAAGTAA ATAAAAAGA 300
 35 GATTGAACAA AAAGTTAATG AAGCAGCTGA AATATTAGGA TTA ACTGAGT ATCTTGGTCG 360
 TAAACCAAAA GCGTTATCTG GCGGACAGCG TCAACGTGTT GCTTTGGGCA GAGCTATTGT 420
 40 TAGGGATGCG AAAGTCTTTT TAATGGATGA ACCATTATCG AATCTTGATG CGAAyTtCGA 480
 GTACAAATGC GCACAGAAAT ATTGAAATTA CATAAGCGAC TTAATACTAC GACAATTTAT 540
 GTTACACATG ATCAA CTGA AGCATTGACG ATGGCTAGTC GAATTGTTGT TTTGAAAGAT 600
 45 GGCGACATTA TGCAAGTCGG CACACCTAGA GAAATATATG ATGCCCTAA TTGCATATTT 660
 GTGGCGCAAT TTATCGGCTC ACCAGCAATG AATATGTTGA ATGCTACAGT TGAAATGGAC 720
 GGATTGAAGG TAGGAACACA CCATTTTAAA TTACATAATA AAAAAATTGA AAAGTTAAAA 780
 50 GCTGCTGGCT ACTTAGACAA GGAAATTATT TTAGGTATTC GAGCTGAAGA CATT CATGAA 840
 GAACCAATAT TTATTC AAC TTCTCCAGAG ACACAATTG AATCTGAAGT AGTTGTATCC 900

	AAATTAGATT CAAGAACTCA AGTGATGGCG AACGACAAGA TTACACTAGC ATTTGATATG	1020
	AATAAGTGTC ACTTTTTTGA TGAAAAACA GGAAATCGTA TCGTCTAAGG GGGAGTATTC	1080
5	ATGTCTAAAA TTTTAAATG TATCACGTTA GCCGTGGTAA TGTATTAAAT CGTAACTGCA	1140
	TGTGGCCCTA ATCGTTCGAA AGAAGATATT GATAAAGCAT TGAATAAAGA TAATTCTAAA	1200
	GACAAGCCTA ACCAACTTAC GATGTGGGTG GATGGCGACA AGCAAATGGC GTTTTATAAA	1260
10	AAAATTACGG ATCAATATAC TAAAAAACT GGCATCAAAG TAAAGCTTGT AAATATTGGT	1320
	CAAAATGATC AACTAGAAAA TATTTTCGCTA GACGCTCCTG CAGGAAAAGG TCCAGATATC	1380
	TTTTTCTTAG CACATGATAA TACTGGAAGT GCCTATCTAC AAGGCTTAGC TGCTGAAATC	1440
15	AAATTATCAA AAGATGAGTT GAAAGGTTTC AATAAGCAAG CACTTAAAGC GATGAATTAT	1500
	GACAATAAGC AACTAGCATT GCCAGCTATC GTTGAAACAA CCGCACTTTT TTATAATAAA	1560
20	AAATTAGTGA AAAATGCACC GCAAACGTTA GAAGAAGTTG AAGCTAATGC TGCCAAACTA	1620
	ACTGATAGTA AAAAGAAACA ATACGGTATG TTATTTGATG CTAAAAATTT CTATTTTAAT	1680
	TATCCGTTTT TATTCGGCAA TGATGATTAT ATTTTCAAGA AAAATGGCAG TGAATATGAT	1740
25	ATTCATCAGC TAGGACTAAA TTCAAACAT GTCGTCAAGA ATGCTGAACG ATTACAAAAA	1800
	TGGTACGACA AAGGGTATCT TCCTAAGGCA GCAACACATG ATGTCATGAT TGGTCTTTTT	1860
	AAAGAAGGAA AAGTAGGACA ATTTGTCACT GGACCGTGA ACATTAATGA ATATCAAGAA	1920
30	ACGTTTGGTA AAGATTTAGG AGTAACAACA TTACCTACAG ATGGTGGCAA ACCTATGAAA	1980
	CCATTCTAG GTGTACGTGG TTGGTATTTA TCTGAATATA GTAAACATAA GTATTGGGCT	2040
	AAAGATTTAA TGCTGTATAT CACTAGTAAA GATACATTAC AAAATATAC AGATGAAATG	2100
35	AGCGAAATTA CTGGACGTGT TGACGTGAAA TCATCTAATC CAAATTTAAA AGTGTGTTGAA	2160
	AAGCAAGCAC GTCATGCTGA ACCGATGCCT AATATTCCTG AAATGCGACA AGTTTGGGAA	2220
40	CCGATGGGCA ATGCAAGCAT ATTTATTTCA AATGGTAAGA ATCCTAAACA AGCGTTAGAT	2280
	GAGGCGACGA ATGATATAAC GCAAAATATT AAGATTCTTC ATCCATCACA AAATGATAAG	2340
	AAAGGAGATT AGTTATGACG AAACGTAACC CTAAATTAGC GGCATTATTA TCTGTTATAC	2400
45	CTGGTTTGGG ACAGTTTTAT AATAAAAGAC CCATTAAAGG GACGATATTT TTTATCTTTT	2460
	TCATCAGTTT TATTTCTGTT TTTTATAGCT TTTTAAATAT TGGTTTTTGG GGATTGTTCA	2520
	CATTAGGGAC AGTACCTAAG TTAGACGATT CTCGTGTCTT ACTTGACAAA GGTATTATTT	2580
50	CTATCTTACT CGTTGCTTTC GCAATCATGC TATATATCAT TAATATTTTA GATGCATATC	2640
	GTAATGCTGA ACGATTTAAT CGCAATGAGG AAATAAAGGA TCCGAAGCGC GTATGGTGGC	2700

55

EP 0 786 519 A2

	TGTAGTTGTA	TTTCCATTAA	TAYYTATGTT	TGGAGTAGCA	TTTACAAATT	ACAATTTATA	2820
	CAACGCGCCT	CCGAGACACA	CATTAGAATG	GGTTGGTTTA	GATAACTTTA	AAACGTTATT	2880
5	CACAATTGGC	GTTTGGCGTA	AAACATTTTT	CAGTGTATT	ACTTGGACAT	TAGTATGGAC	2940
	GCTTGTGCA	ACGACACTTC	AAATTGCATT	AGGGCTGTTT	TTGGCAATTA	TTGTAAATCA	3000
	CCCTGTCGTC	AAAGGTAAGA	AATTTATCCG	TACTGTGTTA	ATCCTACCTT	GGGCTGTACC	3060
10	ATCATTGTG	ACAATTTTAA	TATTTGTAGC	GTTATTTAAT	GATGAATTTG	GTGCGATAAA	3120
	TAATGATATT	TTGCAACCTT	TATTAGGTGT	AGCACCAGCA	TGGTTAAGTG	ATCCGTTTTG	3180
	GGCAAAAGTG	GCATTAATCG	GCATTCAAGT	ATGGCTTGGA	TTCCCATTTG	TCTTTGCACT	3240
15	GTTCACTGGA	GTA CTGCAA	GTATTTCATC	AGATTGGTAC	GAAGCAGCAG	ATATGGATGG	3300
	TGCGTCTAGT	TGGCAAAAGT	TTAGAAACAT	CACATTCCCG	CATGTCATTT	ACGCCACAGC	3360
20	GCCATTGTTA	ATTATGCAAT	ATGCAGGTAA	TTTCAATAAT	TTTAATCTTA	TTTATCTATT	3420
	TAATAAAGGC	GGTCCACCAG	TGTCAGGGCA	GAATGCTGGT	AGTACAGATA	TCTTGATATC	3480
	TTGGGTGTAT	AATCTGACAT	TTGAGTTTAA	CAACTTCAAC	ATGGGTGCAG	TTGTGTCATT	3540
25	AATTATTGGA	TTTATTGTTG	CTATTGTCGC	ATTTATTCAA	TTCAGACGTA	CAAGTACGTT	3600
	TAAAGATGAG	GGAGGTTTAT	AAGATGACAA	AGAAGAAAAA	CATATTAAAA	GCAATCGGTA	3660
	TTTACAGTTT	TATAGCGATG	ATGTTTGTC	TCATTTTATA	TCCACTACTG	TGGACATTTG	3720
30	GCATTTCCCT	TAATCCAGGT	ACGAACTTGT	ATGGTGCCAA	AATGATACCA	GACAATGCAA	3780
	CATTTAAAAA	TTATGCATTC	TTACTATTTC	ATGACAGTAG	TCAATACCTG	ACTTGGTATA	3840
35	AAAATACGCT	TATCGTAGCA	TCTGCAAATG	CACTGTTTAG	TGTGATATTT	GTCACGTTAA	3900
	CAGCATATGC	TTTTTCTAGA	TATCGCTTTG	TTGGTCGTAA	ATACGGGCTG	ATTACATTTT	3960
	TGATTTTACA	AATGTTCCCT	GTATTAATGG	CAATGGTCGC	AATCTATATT	TTGCTAAATA	4020
40	CAATTGGATT	ATTAGATTCT	TTATTTGGAC	TAACACTGGT	ATATATTGGT	GGATCAATAC	4080
	CGATGAATGC	CTTTTTAGTG	AAAGGTTACT	TCGATACGAT	TCCAAAAGAA	CTTGATGAAT	4140
	CTGCCAAAAT	TGATGGTGCA	GGGCATATGC	GTATTTTCTT	ACAAATTATG	CTTCCATTAG	4200
45	CTAAGCCGAT	TTTAGCAGTT	GTTGCTTTGT	TCAATTTTAT	GGGGCCATTT	ATGGACTTTA	4260
	TATTACCTAA	AATACTATTA	AGAAGTCCTG	AAAAATTCAC	ATTAGCAGTT	GGATTGTTCA	4320
	ACTTTATTAA	TGATAAGTAT	GCAAATAATT	TCACAGTGTT	TGCAGCAGGG	GCAATTATGA	4380
50	TTGCAGTACC	TATAGCAATC	GTATTCCTGT	TCTTGCAACG	CTATTTAGTA	TCAGGTTTAA	4440
	CAACAGGTGC	GACAAAAGGT	TAGTTTGAAA	TTAGGAGTGG	GGCAGAATTG	ATAAAGAACC	4500

55

EP 0 786 519 A2

GGGTGTGGTG GTATTGCGAA TGGCAAGCAC ATGCCAAGTT TACAAAAAGT TGAAAAATGTT 4620
GAAATGATCG CATTTTGTGA CGTAGACATT TCGAAAGCAG CGAGTGC GGC AGAAGCATAC 4680
5 GGAAC TGACA ATGCAAAGGT TTATGATGAT TACAAAGCAT TGTTAAAAGA TGACACGATT 4740
GATGTTATCC ATGTTTGTAC GCCAAATGAC TCGCATTGTG AAATTACTGT AGCAGGGTTG 4800
CATGCTGGTA AACATGTGAT GTGTGAAAAA CCAATGGCTA AAACGACAGC AGAAGCTCAA 4860
10 AAAATGATAG ATACAGCTAA ATCAACAGGT AAAAAATTAA CAATAGGTTA TCAAAATCGT 4920
TTCCGAGCAG ATAGTCAATT TTTACATCAA GCAGCGCAAC GTGGCGACTT AGGAGACATT 4980
15 TACTTCGGAA AGGCACATGC CATTTCGTCG CGAGCAGTAC CAACATGGGG TGTCTTTCTA 5040
GACGAAGAAG CTCAAGGTGG AGGACCATTA ATCGATATCG GTACACACGC TTTAGATTTA 5100
ACGTTATGGA TGATGGATAA TTATGAACCA GAATCAGTGA TGGGTTCAAC ATTCCATAAA 5160
20 TTAAATAAAC AGCATCATGC GGCAAACGCT TGGGGTTCAT GGAATCCAGA TGAATTTACA 5220
GTTGAAGATT CTGCGTTTGG ATTTATTAAA ATGAAGAATG GAGCGACGAT CATTTTAGAA 5280
TCCGCTTGGG CGATTAATTC TTTAGAAGTG GATGAGGCAA AATGTTTCATT ATCAGGAACT 5340
25 AAAGCAGGTG CTGATATGAA AGATGGTCTA CGTATTCATG GTGAAGACAT GGGTACACTT 5400
TATACCAAAC ACGTTGAATT GGAAAACAAA GCGCTCGACT TTTATGAAGG TAATGAAGTG 5460
GATGAAGCTG AAGAAGAAGC AAAAGCTTGG ATTGATGCAG TTGTAAATGA TACTGAACCA 5520
30 GTTGTGAAAC CGGAACAAGC AATGGTAGTT ACAAAAATTC TTGAAGCGAT TTATCAGTCT 5580
GCAAAATCAG GCAAAGCAAT TTACTTTGAA TAACATCATA CGGTAAGGAG GCACATCATG 5640
ACAAAATTAA AAGTTGGTGT GATAGGTGTT GGTGGTATTG CACAAGACCG TCATATTCCA 5700
35 GCATTGCTGA AACTCAAAGA CACAGTCTCA TTAGTTGCAG TACAAGATAT TAATACAGTG 5760
CAGATGATTG ATGTTGCGAA GCGCTTTAAT ATACCTCATG CAGTTGAGAC ACCTAGCGAG 5820
40 CTGTTTAAAC TTGTTGATGC GGTGGTCATT TGTACACCTA ATAAATTCCA TGCTGATCTT 5880
TCTATAGAAG CATTGAACCA TGGTGTCCAT GTATTGTGTG AAAAGCCAAT GGCGATGACG 5940
ACGGAAGAGT GTGATCGCAT GATTGAAGCG GCTAATAAAA ATCACAAATT ATTAAGTGTC 6000
45 GCATATCATT ATCGTCACAC AGATGTGGCA ATTACTGCTA AAAAGCAAT TGAATCAGGT 6060
GTGGTTGGTA AACCTTTAGT AGCACGTGTA CAAGCGATGC GTAGGCGTAA AGTGCCTGGC 6120
TGGGGTGTTT TTACCAATAA AGCGTTGCAA GGTGGCGGTA GTTTAATCGA TTATGGTTGC 6180
50 CACTTGTTAG ACTTATCTTT GTGGCTACTA GGTAAAGATA TGGTGCCGCA TGAAGTGCTA 6240
GGAAAAACAT ATAATCAATT GAGCAAACAA CCGAATCAAA TTAATGATTG GGGAACATTT 6300

55

EP 0 786 519 A2

	GCAAGCATGC AGTTTGAATG TTCGTGGTCT GCAAATATCA AAGAAGATAA GGTTCACGTT	6420
	AGTTTATCAG GAGAAGATGG CGGTATCAAT TTATTTCCAT TTGAAATATA TGAGCCCCGC	6480
5	TTTGGAAC TA TTTTGAAG CAAAGCTAAT GTTGAGCATA ACGAAGACAT TGCTGGTGAG	6540
	AGACAGGCGC GTAAC TTTGT CAATGCGTGT TTAGGGATAG AAGAGATTGT GGTGAAACCG	6600
	GAAGAAGCAC GCAATGTAAA TGCCCTTATA GAAGCGATTT ATCGTAGCGA TCTTGATAAC	6660
10	AAGAGCATAC AACTTTAATG ATTATCATAT ATGATACAAA ATTCTCAATA TAAAAAGAAG	6720
	GAGTGCTTTT CAATGAAAAT AGGTGTATTT TCAGTATTAT TTTACGATAA AAATTTTGAA	6780
	GATATGTTAG ATTATGTCTC AGAATCTGGA TTGGATATGA TTGAAGTTGG AACAGGTGGT	6840
15	AACCCAGGAG ATAAATTTTG TAAGTTAGAT GAGTTGTTAG AAAATGAAGA CAAGCGCCAA	6900
	GCATTTATGA AGTCAATCAC AGACAGAGGC TTACAAATAA GTGGTTTCAG TTGTCATAAC	6960
20	AATCCAATTT CTCCAGATCC GATAGAAGCG AAAGAAGCCG ATGAAACGTT ACGTAAACA	7020
	ATCCGTTTAG CAAATCTATT AGACGTGCCA GTTGTTAATA CATTTTCTGG CATTGCAGGA	7080
	TCAGATGATA CCGCTAAAA GCCTAATTGG CCTGTTACAC CTTGGCCAAC AGCCTACTCT	7140
25	GAAATTTATG ATTATCAGTG GAATGAAAAG TTGATACCAT ATTGGCAAGA TTTAGCTGAG	7200
	TTTGCAAAAG AGCAAGATGT AAAAATTGCC ATAGAGTTGC ATGCAGGATT TTTAGTGCAT	7260
	ACACCATATA CAATGTTGAA GTTACGTGAG GCTACAAATG AATATATCGG TGCTAACTTA	7320
30	GATCCTAGTC ATCTATGGTG GCAAGGTATT GACCCAATTG CTGCGATTCTG CATATTAGGC	7380
	CAAGCAAATG CAATTCATCA CTTCCATGCT AAAGATACGT ATATTAATCA AGAAAATGTA	7440
35	AATATGTATG GTCTAACTGA TATGCAACCA TATGGTAACG TTGCGACAAG AGCATGGACA	7500
	TTCCGTACAG TTGGTTATGG ACATAGTCCA TATGTATGGG CAGATATCAT AAGTCAACTT	7560
	ATTATTAATG GATATGATTA TGTATTAAGT ATTGAACATG AAGATCCTAT TATGTCAGTA	7620
40	GAAGAAGGTT TCCAAAAAGC TTGTCAAAC TTGAAATCTG TTAATATTTA CGACAAGCCA	7680
	GCAGACATGT GGTGGGCATA ATACGAACTC GAGGTTAGTC TGAAGTTTGT CTGAAGTAAG	7740
	ACTGGTGGCA GTGTTGAATA AATGCATATG TCGCCAAGCC ATTGCCAAAA ATTTACACACC	7800
45	TTAAATCAAG TCATTGTTTG TAAAGAAGGT GTACTTTATA TAAGTATATA GCGATGGTCA	7860
	TACCCATTCA CAGTAACAAT CCTCACCATT GAAAAGAGTA TATAACCTTT TCAATAGTGA	7920
	GGTATATGAT AATAAAAAAA GCCTGTTGTC ACAATGGTCA TAGACACGAC ATACTTTAAA	7980
50	GGTTTCTGAA TATAATATTT CAGAATGCAC TTTAAAGATG GACGTCGATG TAGACTAAAG	8040
	TGATGACAGG CTTTCATCTT TTTAAATATT CATTAATTTT TCTTCTTGTT TAATACGTAC	8100

55

EP 0 786 519 A2

	TAATACACCG ATTAATTCAG GAATGATGTT TAAGAAGTAA TTTGGGTGTT TTGTAATTTT	8220
	ATATAATCCA GATTTAATAA TAGGATGGTT AGGTAAAATG AATAATTTTA ATGTCCAAAT	8280
5	ACCACCTAAA GTTTTAATAA CCATAAATAA CATGATATAA GCAAAGATTA ATATAACTAA	8340
	GCCAATACCA TTTGCAAAGC TAAATGTATC TTTATTAATA AATGCCTCTA CACCAGCCAA	8400
	TACATAAATT AAAACGTGTG TTATTGCTAA AAACCTTCGAA TTTTAAACGC CATATTCAAC	8460
10	TGCACCGTCT GCTTTTAATT GTTTTGAGTG ATTAATAGAT ATCTTTAAGC TGACAAGTCT	8520
	GATACAGAAA AAGATAAGTA ATATAGATAG AATCATGATG TCCTCCGTCA TTATGTCATA	8580
	TGTATAAGCG TTGATTTTGA CAACATAAAG TATTTTATAG ATAAAGCTTG TCAAATACTA	8640
15	TTAACTATTT ATTAATTTTA GTACATAAAT ATGTTTCTAA GTATGTGTTT ATGTTTCAGTA	8700
	TTTTGGATAA TTTAATAATT TTAAGGATAT TAAGCGCTTA CACCGACGTG ATATATTGGG	8760
20	CTTAACGAAA ATGATTGAGG TGACAGAGAT GAACTTTTTT GATATCCATA AGATTCCGAA	8820
	CAAAGGCATT CCATTATCGG TACAACGTAA ATTATGGCTT AGAAACTTCA TGCAAGCTTT	8880
	CTTCGTAGTG TTCTTTGTTT ATATGGCTAT GTATTTAATT CGAAACAAC TTAAGGCGGC	8940
25	ACAACCGTTT TTAAGAGAGG AAATTGGATT ATCTACATTA GAACTTGGTT ATATCGGATT	9000
	AGCATTTAGT ATCACGTACG GTTAGGAAA AACATTACTT GGATATTTTG TCGATGGACG	9060
	TAACACAAAA CGTATTATCT CGTTCTTACT TATCTTATCT GCGATTACAG TTTTAATTAT	9120
30	GGGATTTGTT TTAAGTTACT TTGGTTCTGT AATGGGATTA TTAATTGTAC TTTGGGGACT	9180
	TAACGGGGTG TTCCAATCAG TTGGTGGACC TGCAAGTTAT TCAACGATTT CAAGATGGGC	9240
35	GCCAAGAACG AAACGTGGCC GATACTTAGG ATTCTGGAAT ACATCACATA ATATCGGTGG	9300
	TGCCATAGCA GGTGGTGTG CACTTTGGGG TGCTAATGTA TTCTTCCATG GAAATGTTAT	9360
	AGGGATGTTT ATTTTCCCAT CGGTGATTGC ATTACTTATT GGTATCGCAA CATTATTTAT	9420
40	CGGAAAAGAT GATCCGGAAG AATTAGGATG GAATCGTGCT GAAGAAATTT GGGAAGAGCC	9480
	GGTCGATAAA GAAAATATTG ATTCTCAAGG TATGACGAAA TGGGAGATCT TTAAAAATA	9540
	TATCCTGGGA AATCCTGTTA TATGGATTCT ATGTGTTTCA AACGTCTTTG TATACATTGT	9600
45	ACGAATCGGT ATTGATAACT GGCACCGTT ATATGTGTCA GAGCATTAC ACTTTAGTAA	9660
	AGGCGATGCA GTTAATACGA TATTCTACTT TGAAATTGGT GCATTAGTTG CAAGTTTATT	9720
	ATGGGGCTAC GTATCAGACT TATTAAAAGG TCGTCGTGCA ATTGTAGCTA TTGGCTGTAT	9780
50	GTTTATGATT ACATTGTGTG TCTTATTCTA CACAAATGCT ACAAGTGTCA TGATGGTTAA	9840
	CATTTCAATTG TTTGCATTAG GTGCGTTAAT CTTTGGTCCG CAATTATTAA TTGGTGTATC	9900
55		

EP 0 786 519 A2

	CGCGTATCTA TTCGGTGACT CAATGGCGAA AGTTGGTTTG GCGGCTATTG CTGATCCAAC	10020
	ACGTAACGGT TTAAACATCT TTGGATATAC ATTAAGTGGG TGGACAGATG TTTTCATCGT	10080
5	CTTCTATGTT GCATTATTCC TAGGCATGAT TCTATTAGGA ATCGTTGCTT TCTATGAAGA	10140
	AAAGAAAATT AGAAGTTTAA AAATTTAATA TAAATCGGAT TAAAAGTATC GCCAATCTAT	10200
	TGCAATATAG TTGGCAATCC TGCCCCGACG GCATGTGCGT GAAGAGATGA AAGATACTGC	10260
10	TTCTACCCTT GCAAATATAT CATCTCTATG TCTCGGGGCA GATCATAATT CCCTGTTATG	10320
	AAGTATCCTT ATTTGCCCGA CTTAGGGTGA CTCAATGAAT TTAATCCTTA CAATAAAGAC	10380
15	ATATAGCGGT GTCAATATTG TAGGGAGTAT TGTTTTATAT TTAAACTCTC TAAAAAGCGG	10440
	ACTGAAAGAA AAGTGAAAC TTCTCTATCA GTCCGCTTTT TCATAGAACA AAATGGAGGC	10500
	GCCATAATCA TTAGTTATGT GCTAATCTAT TTTGCTTGCT TACAATAATC ACTTGGCGAC	10560
20	ATTTGTAAAT ATTTTTTAAA ATGATAGCTA AACATTTTAT ACTCTGAAAA GCCTACTTTG	10620
	TCTGCAATTT CATAGTGTTT GTAATGTCGA TCTAACAATT GCAGAGATTG TAAAATACGA	10680
	TAGCGATTTA AATAATCGAC AATTGTAATA CCAACATGAT CTTTAAATGT TCGCATCGCA	10740
25	TACGATTCAC TAACATCGAT ATGTTGAATT AAATCTGAAA CAGtCACTTT CGTTTGATAA	10800
	GATTGCTTAA TTTGATCCAC AATCTGGTTT ACATAATAAT CATCGTATTC TACTTTTAAT	10860
	AGTGGTTGGA AGGCATCATG ACAAGATGCT AAGCTACGGC CGTTCTGTGA TTGTTGCTCT	10920
30	AATAAGGTAC GGACAAGTCT TCCTAAAATA ACTTCTAATT GTGCATGGTC TACTGGTTTT	10980
	AATAAATAAT CAAGAACATG ATGTTGAATG CCGGCTTTCA TATATTCAAA GTCATCGTAA	11040
35	CTCGATAATA TGATGACATT ACAATCTAGA TCGCCAATAT CATTGAGTAA ATCGACGCCA	11100
	TTTTTACGTG GCATACGAAT ATCAGTAATT ACTAATTCTG GCTGATGTTG TTGAATTAGT	11160
	GATAATGCTT CAACACCATC TTTAGCAGTG TATATTGTAT TGAAATGATA GTCTCCCCAA	11220
40	GGAATGATTT GCTTTAATCC TTCTCGAATA ATTCTGTCAT CATCACAAAT AACTACCTTA	11280
	AACATCTACA TTCCCCCTTG AAAGTGGTAT TTTATAACAA ATTAACGTAC CTTGATTACG	11340
	CTTTGAAAAA ATATGGAGTC GTGCATGTGA ACCATATTGA ATCATTGCTT TATTGTGTAA	11400
45	ATGATTTAAT CCCAAATGCT TAGTATCAAA TACATCATTA TTAAGAGATT GCGGTACATA	11460
	TTGCAGGCGA GATGACGACA TCCCGATACC ATTGTCGCAA ACTAAAACAT GTAAATTCTG	11520
	ACGTGCCAAT GTCAGGCGTA TAGTAATGTC CAATGACTCA GTATCTCTAC CATGTTTAAT	11580
50	AGCATTTTCT ATGAGTGGCT GAAGCATCAT TTTACCAATT GTCTGGTGAC GCGCTTCTTC	11640
	AGAACTTTCA ATATGGAGCT TAATCATGTC ATCAAAACGG aTGTTTGTGA TTGCAACATA	11700

55

EP 0 786 519 A2

	GTAACGTAAC	ATTGCGATA	ATTGTTGGAC	CACAGTTtGT	GCTAATTTTCG	GAGATAACGT	11820
	AATTAAATAT	TGTATTGTTT	GCATCGTATT	GAATAGGAAA	TGAGGCTGGA	ATTGGCGTTC	11880
5	TATTTCCCTT	AACTGAATAT	CACGCAAGCG	ACGTTCTGTA	TGCTCGATAG	AATGGATCAG	11940
	TTGCTCATT	GATTCAAATA	AATCGTAAAT	ATAATTATTA	ATTTCTTCTA	GTTCACTGTT	12000
	GTTTTTTAAA	GGCGTATATG	TACCTAGATG	ACGATTTTGT	GCATAGTAAA	TTTTTTGAAT	12060
10	AATCGTTTCG	ATATCTTTTG	TTTGTCTGTT	AGCCATATTA	TCTGCGCTAA	TGAAACCAAA	12120
	TATTACTAGT	AAAACAAGAA	CTACGGCCAT	AACAATTAAC	AACGTGATAC	CATCTTCAAT	12180
15	GTTTTTCATG	ATATCTTTAT	AAATAATGAG	ACGATGGTCA	GCATGGTTTA	ATTTTACAGA	12240
	TTCATTGATA	AATCCGAATT	GTTGTGGTcT	ATACTTTTCA	CCTATAGTAA	AACGGTCATC	12300
	GTTGGCGTAT	AAAATATTGT	CATATTGATC	AmCGATAAGT	GCGAATTGTC	GGTTATCTTT	12360
20	CtTAATTTCA	CTTAAACGTG	GGGTGTtAGC	CATATAAAAt	TTaAGCATAT	ATGTACTATT	12420
	TTTGAATTTA	AGCTGATGCG	TTGAAAATAA	ATACATATTT	TTAGTGTTTA	AATGTTTCATA	12480
	ATTATTGGTT	ATAAACTGAT	TTGGTCCAGA	TAATTCATAA	TAAAGTGTTG	CGGGCTGTTG	12540
25	GkGTATTAAT	TTTAATAATT	CACGTTTTGT	AGCGGTCACA	TCATGATGAT	TTGyTAAATC	12600
	GAGCTCTTGA	AACGAATTAT	TATGCTGTGT	AATAAATGTC	TGAATCTGCT	TTTCAGTATG	12660
	ATGTAAAGAT	GACTGACTTT	CATCAACATG	TTGATGAATC	GTACGATGCT	CAATCCAAAT	12720
30	ATAGATGGCA	TAGAAGCTTA	CTAGTCCAAT	AATAATGACT	AAAAATACTG	GAAAAATAGT	12780
	AGACnCAAAT	AACGATCGTC	TTAATTGATG	TCTATAAGGT	TTGTATGCCn	TCATTGAATC	12840
35	ATCTCCAAAA	ATTTATGATG	TGGAATATCC	GGTAATTTAG	ATTTCGGTAT	TAAAGGTATG	12900
	TTCTTAAGAT	TTTCGATAGA	CTGATCGCTT	TGTTCACTAA	CATCCTTTTCG	AATTGACTTG	12960
	GCATcGAACT	CTGCAACTAA	TCGTtGTTGT	ACTGAGCGGC	TTGTTAAATA	TTGCACTAAC	13020
40	TTTTTACGCT	TAGGATGAGG	GTGTGCATTT	TTAACTAAAG	CAATrCCATC	AACATTTAAC	13080
	ATTGTTCCCT	CAATTGGATA	AACGATTGAT	ACAGGATAAC	CTTGTTTTTT	CCATGTGCGT	13140
	GCATCTTGTT	CGTAGCTTAG	ACCTGCGTAA	TATTTACCTT	TTGCAACATC	TTCAATGACT	13200
45	TTAGACGTCT	TTGACAGTTG	CATCGCATGG	TTTTGGAATT	GATGCACATC	ACTTACTCGA	13260
	TGATGCATGC	TATAAATAGC	ACGCATATGT	TGATAGCCTG	TCGTTGTTGT	ATTTGGATTT	13320
	GAGTACGCAA	TTTTACCTTT	AAGTATAGGT	TGTAATAAAT	CTTGATAACC	TCGAATCTTA	13380
50	ATATCTCCTT	GTAAATCTGA	ATTCACTACT	ATAACTGTTG	GCATTAATAG	AAAACTAGTA	13440
	ACATATTTAT	TGTTGAGCG	ATAATCCTCT	AATTGCTGTG	TTACAGATGT	ATCTTGATAG	13500
55							

	CCACGCTCCG AAAAATCTTC GTTATGCAAG TTTGAAAGCA GTACTTGAGT AGATCCGTGT	13620
	TTAATTTCAA TTTTGACATG CTCTTGTTTT TCAAATTCAT TTAAAATTGG ACGAATCAAG	13680
5	TTTGATTGAT ACGGAGAATA AACTGTTAAT ACATTTTTAT CGGATTGAGA GTGACGCGTA	13740
	TTAGCGCATG CTGaTAAAAA AATGAGAAAT AATAGCAAGA TATAAATTTT TGATTTTCATG	13800
10	ATATCCCATC AATTCTATGT ATATTTTAAT ACAATAATTT TAGCAATAAA TGACGCATAA	13860
	GTAATGTTAA ATATTTAGAA ATGTTTATAG ATGACTTGTT AAGACGTTGC AAATGTTGTG	13920
	ATAGCACAAA ATTTTGTGTT GTCAAGACGA TTTACCGAGG CTGTAAAATC AAAGTGTAT	13980
15	ATTTTATTG TAGCTGTTAT ATAAAAATCG GCAAGATATT GAACGGTTC AAAGTGAATT	14040
	TTTACGTCAA TAAAAGTATT TAATCCAGTC TCTTCATATA TAAAAGTAAA TCTTTCTAAG	14100
	TGTTGATTIA ACGCTTATCA ACAATCATTT TTTATAAACA AATATATACT CCTAAATTAA	14160
20	CTTTTAAAGC AATGAAAATA GTGAACATTA TAACTGTTGT GTAACAGAAT GCAATTAGCA	14220
	TATTACTGTT ACACAAATTA GTACAGTTTC TATGTTTTGA CATACTTTG ATGAAAATTG	14280
	TACATAATTT ATGTGAAAAA AATCACAACA AACATGCTAC AATGACTATG AAAACGTTAA	14340
25	CATAGCATTT CAAATTCACA ACATTATACA GATGGAGGCG TTTAGTATGT TAGAAACAAA	14400
	TaAAAATCAT GCAACAGCTT GGCAAGGATT TAAAAATGGA AGATGGAACA GACACGTAGA	14460
	TGTAAGAGAG TTTATCCAAT TAAACTACAC TCTTTATGAA GGTAATGATT CATTTTtagc	14520
30	AGGACCAACA GAAGCAACTT CTAAACTTTG GGAACAAGTA ATGCAGTTAT CGAAAGAAGA	14580
	ACGTGAACGT GCGGCGATGT GGGATATGGA CACGAAAGTA GCTTCAACAA TCACATCTCA	14640
35	TGATGCTGGT TATTTAGACA AAGATTTAGA AACAAATTGA GGTGTACAAA CTGAAAAGCC	14700
	ATTCAAACGT TCAATGCAAC CATTCGGTGG TATTCGTATG GCGAAAgcAG CTTGTGAAGC	14760
	TTACGGTTAC GAATTAGACG AAGAAACTGA AAAAATCTTT ACAGATTATC GTAAAACACA	14820
40	TAACCAAGGT GTATTCGATG CATATTCTAG AGAAATGTTG AACTGCCGTA AAGCAGGTGT	14880
	AATCACTGGT TTACCTGATG CATACGGACG TGGACGTATT ATCGGTGACT ATCGTCGTGT	14940
	AGCTTTATAT GGTGTAGATT TCTTAATGGA AGAAAAAATG CACGACTTCA ACACGATGTC	15000
45	TACAGAAATG TCAGAAGATG TAATTCGTTT ACGTGaAGAA TTATCAGAAC AATATCGTGC	15060
	ATTAAAAGAA TTAAAAGAAC TTGGACAAAA ATATGGTTTC GATTTAAGCC GTCCAGCAGA	15120
	AAACTTCAAA GAAGCAGTTC AATGGTTATA CTTAGCATAC CTTGCTGCAA TTAAAGAACA	15180
50	AAACGGTGCA GCAATGAGTT TAGGTCGTAC ATCAACATTC TTAGATATCT ATGCTGAACG	15240
	TGACCTTAAA GCAGGCGTTA TTAAGTAAAG CGAAGTTCAA GAAATTATTG ACCACTTCAT	15300

55

EP 0 786 519 A2

	AGACCCAACT TGGGTAAC TG AATCTATCGG TGGTGTAGGT ATTGACGGAC GTCCACTTGT	15420
	TACGAAAAAC TCATTCCGTT TCTTACACTC ATTAGATAAC TTAGGTCCAG CTCCAGAACC	15480
5	AAACTTAACA GTATTATGGT CAGTACGTTT ACCTGACAAC TTCAAAACAT ACTGTGCAAA	15540
	AATGAGTATT AAAACAAGTT CTATCCAATA TGAAAATGAT GACATTATGC GTGAAAGCTA	15600
	TGGCGATGAC TATGGTATCG CATGTTGTGT ATCAGCGATG ACAATTGGTA AACAAATGCA	15660
10	ATTCTTCGGT GCACGTGCGA ACTTAGCTAA AACATTACTT TACGCTATCA ATGGTGGTAA	15720
	AGATGAAAAA TCTGGTGCAC AAGTTGGTCC AAACCTTCGAA GGTATTAAACA GCGAAGTATT	15780
	AGAATATGAC GAAgTATTCA AGAAATTGTA TCAAATGATG GATTGGCTAG CAGGTGTTTA	15840
15	CATTAACCTCA TTAAATGTTA TTCACTACAT GCACGATAAA TACAGCTATG AACGTATTGA	15900
	AATGGCATTAA CATGATACAG AAATTGTACG TACAATGGCA ACAGGTATCG CTGGTTTATC	15960
20	AGTAGCAGCT GACTCATTAT CTGCAATTAA ATATGCACAA GTTAAACCAA TTCGTAACGA	16020
	AGAAGGTCTT GTAGTAGACT TTGAAATCGA AGGCGACTTC CCTAAATACG GTAACAATGA	16080
	CGACCGTGTA GATGATATTG CAGTTGATTT AGTAGAACGC TTCATGACTA AATTACGTAG	16140
25	TCATAAAACA TATCGTGATT CAGAACATAC AATGAGTGTA TTAACAATTA CTTCAAACGT	16200
	TGTATACGGT AAGAAAAC TG GTAACACACC AGACGGACGT AAAGCTGGCG AACCATTTCG	16260
	TCCAGGTGCA AACCCAATGC ATGGCCGTGA CCAAAAAGGT GCATTATCTT CATTAAGTTC	16320
30	TGTAGCTAAG ATCCCTTACG ATTGCTGTAA AGATGTATT TCAAATACAT TCAGTATCGT	16380
	ACCAAAATCA TTAGGTAAAG AACCAGAAGA TCAAAACCGT AACTTAACTA GTATGTTAGA	16440
	TGGTTACGCA ATGCAATGTG GTCACCACTT AAATATTAAC GTATTTAACC GTGAAACATT	16500
35	AATAGATGCA ATGGAACATC CAGAAGAATA TCCACAGTTA ACAATCCGTG TATCTGGTTA	16560
	CGCTGTTAAC TTCATTAAAT TAACACGTGA ACAACAATTA GATGTAATTT CTCGTACATT	16620
40	CCATGAAAGT ATGTAACAAA ATTTAAGGTG GGAGCACTAT GCTTAAGGGA CACTTACATT	16680
	CTGTCGAAAG TTTAGGTACT GTCGATGGAC CGGGATTAAAG ATATATATTA TTTACACAAG	16740
	GATGCTTACT TAGATGCTTG TATTGCCACA ATCCAGATAC TTGGAAAATT AGTGAGCCAT	16800
45	CAAGAGAAGT CACAGTTGAT GAAATGGTGA ATGAAATATT ACCATACAAA CCATACTTTG	16860
	ATGCATCGGG TGGCGGTGTA ACAGTCAGTG GTGGCGAACC ATTGTTACAA ATGCCATTCT	16920
	TAGAAAAATT ATTGTCAGAA TTAAAAGAAA ATGGTGTGCA CACTTGCTTA GACACATCGG	16980
50	CTGGATGTGC TAATGATACA AAAGCATTTC AAAGGCATTT TGAAGAATTA CAAAAACATA	17040
	CAGACTTGAT ATTATTAGAT ATAAAACATA TTGATAATGA CAAACATATT AGATTGACAG	17100

55

EP 0 786 519 A2

	TATGGATTCTG ACATGTCCTT GTGCCTGGTT ATTCTGATGA TAAAGACGAT TTAATTAAAC	17220
	TAGGGGAATT TATTAATTCT CTTGATAACG TCGAAAAGTT TGAAATTCTG CCATATCATC	17280
5	AGTTAGGTGT TCATAAGTGG AAAACATTGG GCATTGCATA TGAATTAGAA GATGTCGAAG	17340
	CGCCCGATGA TGAAGCTGTT AAAGCAGCCT ACCGTTATGT TAACTTCAAA GGGAAAATTC	17400
	CCGTTGAATT ATAAATACAA TTCAGACCGA AAAGAAAGCA TATGCAACTT CAAGAGTGAA	17460
10	GGGGCATATG CTTCTTTTTC AATTGAGTAT TGAGTATTAG CAAGACGTAG TAAGTATATG	17520
	AGACAACTTC TACAATGGTT GAAGGAAGAC GTTTTTGTAA GTAGCTATGC TGATAAAGAA	17580
15	TGTGATGTCT TGTTAAAGGT GGGGTTCCAA TATCATCATT TAGCTGATGT TGAATGGGTT	17640
	ATTATTGCT ACTGTCATAT GAATATGAGT CTTTTCAAAT TTTTATTGAC CCTGAGTAAT	17700
	GAAAAATATT AAGATGAAAC TTAATATTAA AgCAATGCGG AGCGTGATTA TGAAGAGAAT	17760
20	TAGTAAAGAT ATATGGGCAG TATTTAAATT ACTGTATCaA AATAAAGGGC GTTTTAGCAT	17820
	TAATGCCTTA CTATTGCAGT TAATCATGAT TTTTATTAGT AGTACATACT TAATTTTACT	17880
	ATTTAATATG ATGTTAAAG TAGCTGGcAA AGCCAACTTA CGATTAACAA TTGGACGGAA	17940
25	ATCGTTAGTC ATCCCGCCAG TGTGATACTT CTTATTATAT TCATATTAAG TGTGCCTTT	18000
	CTGATTTATG TAGAGTTTTT ATTGTTAGTT TATATGGTTT ATGCCGGCTT TGATCGACAG	18060
	ATTATTACAT TTAAATCCAT TTTTAAAAAT GCCTTTGTAA ATGTGCGTAA ACTCATAGGT	18120
30	GTACCAGTTA TTTTCTTTGT CATTTATTTA ATGTTAATGA TACCCATTGC CAACCTAGGA	18180
	CTAAGTTCAG TATTAACAAA AAATATTTAC ATACCTAAAT TTTTAACGGA AGAACTTATG	18240
35	AAAACGACGA AAGGTATAAT CATTTACGGT ACCTTTATGA TTGCTGTATT TATATTAAAT	18300
	TTTAAATTAA TATTTACTCT ACCGTTAACG ATTTTAAACC GCCAGTCGTT ATTTAAAAAT	18360
	ATGAGACTAA GTTGGCAAAT TACGAAGCGA AATAAGTTTC GGCTTGTTAT AGAAATAGTT	18420
40	ATATTAGAAC TCATCATTGG TGCGATTTTA ACATTAATTA TTTCAGGAGC AACATATCTT	18480
	GCTATTTGTG TAGATGAAGA AGGAGATAAG TTTTTAGTCT CATCAATTTT ATTTGTTGTA	18540
	TTGAAAAGCG CATTGTTCTT CTATTATkTA TTtACGAAAT TATCATTAAAT CAGTGTGTTA	18600
45	GTACTGCACT TAA	18613

(2) INFORMATION FOR SEQ ID NO: 113:

(i) SEQUENCE CHARACTERISTICS:

- | | |
|----|-----------------------------|
| 50 | (A) LENGTH: 1214 base pairs |
| | (B) TYPE: nucleic acid |
| | (C) STRANDEDNESS: double |
| | (D) TOPOLOGY: linear |

55

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 113:

	AAAGTTTTAA AAGGGGTGAG ATACTTGGCG AATAATCCAT TCCAGCTTTG CGTTTAAAAG	60
5	GAATTATACT TGCCATTGTC GGTGCTTGTT TATGGGGATT AGGTGGTACT GTTTCTGATT	120
	TCTTGTTCAA ATATAAGAAT ATTAATGTCG ATTGGTACGT CACTGCTCGA CTTGTAGTCA	180
	GTGGTGTTTT CTTACTTATT ATGTACAAAA TGATGCAACC CAAACGTTCA ATATTTAGCG	240
10	TATTCCAAGA TCGACGTATG TTAGGCAAAT TACTTATCTT CAGTATACTG GGCATGTTAG	300
	TAGTACAATA TGCTTATATG GCATCTATTA ATACAGGTAA TGCTGCGATT GCAACATTAC	360
	TACAATACAT TGCGCCAGTT TATATTATTA TTTGGTTTGT CATAAGAGGC GTTGCAAAAC	420
15	TAACATTATT TGATGTGCTT GCTATTATCA TGACACTATT AGGAACATTT TTATTATTAA	480
	CAAATGGTTC ATTTTCTAAT TTAGTCGTCA ATCCTGCAAG TTTATTCTGG GGTATTTTAG	540
	CTGGTGTAGC ACTCGCTTTT TACACAATTT ATCCTTCAGA CCTACTTAAC CGCTTCGGTT	600
20	CGATTCTAAT TGTCGGGTGG GCAATGCTTA TTTCTGGTGT TCGGATGAAT TTACGCCATC	660
	CAATTTGGCA CATTGATATC ACTAAATGGG ACATATCAAT TATATTATTT TTAATCTTTG	720
	GTATTATCGG TGGTACCGCA CTCGCATTTT ATTTCTTTAT CGACAGTTTA CAATACATAT	780
25	CAGCGAAAGA AACAACTTA TTCGGAAC TGGAACCTGT CGTAGCCGTT ATCGCAAGCA	840
	GTCTATGGTT ACATGTGGCA TTCAAACCAT TTCAAATCGT AGGCATCATT CTTATTATGA	900
30	TTTAAATTTT ATTACTATCA CTTAAAAGAC AACCTGAAAC ATTAGATGAA TAAGAAAAC	960
	CTGATAATCA CTTTAGCAAG TAACTATTAT TTAACAACGT AGTTACCTTA TAGGTGATAT	1020
	CAGAGTTTTT TATTTTAGTT AATAATATTT TTCACTGGT ATAAAAAGC GTCGTCGCTC	1080
35	TGGTAATCGG AAATACTGGA ATAAATATG GAATTGGGTA ATAATCCCAG GTANTAAAAG	1140
	TCCATGTTCC GATAnCCTnT CCGCAnCTCC AACCAAATTT GCCGATAAGG TTCCAAAAGG	1200
40	CATCCTGGGG GTAC	1214

(2) INFORMATION FOR SEQ ID NO: 114:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 9458 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 114:

	ATTTTGGTTT CATTACCGAT GGGGnATAC AGCAAACACA nCTAAAATAA CTATCAATAG	60
--	--	----

	CTTAGACAAT	AAAAAATATG	CCACTACAAT	CGCTAATATT	ACGATTAAAA	AAGAAGCGTT	180
	AACGATTACT	TTCATCGTTG	TTCTATCTCT	GAACATCATA	TTAAAGACAA	CTAGACTAAT	240
5	TGATAATGAA	ACAGCAAAAA	AAGTAATAGC	TAACACTAAT	TTCATCATAA	ATAGACAGAC	300
	TAAACCTATG	ACTAATAATG	TATTAGAAAT	TACAGCTGAC	GTTTTTAACA	TTCTCGaATT	360
	AATATGCACT	CACCCTTTTT	ATTAAATAA	CTTACATAAT	CATAATAATA	CATGATGTTT	420
10	CATAGGCCTG	TCGATGATTG	ATTCACAATA	GCACGTGATT	TTTTTGTTTT	TCAATATTAT	480
	TCATTTATTC	CATCAAAAAC	ACCCTTTTTA	ATTTTACAA	AAATTAAAAA	AAGTGCTCCT	540
	ACACTGCTTG	CATGTAGAAA	CACTTTTTCA	TTGTAATGTT	ATTCTTCTCG	AGACATACCT	600
15	TTTAGCATAT	TAAGCATGTA	TGTTAAACTA	CGGTTCACTG	CGTCATCTTT	CAATACGCCC	660
	AATAGACTTC	TTATAGTTGT	CTTAGCATTT	GGACTCGCTT	GATTGGCAAC	GTGTAATCCT	720
20	TTATTAACCT	TATTTAGGAA	GTCGCTTAAA	TCTGATACAT	TGAGTTCACC	TAATAAAAAT	780
	ACCATTGAAG	CCATATTAGA	TAATAGCCCT	GTATAAATAT	CTTTATTAAG	TTCAACTGCA	840
	AATTTATTTA	TGATGACTTG	ACGTCCTCGA	ATTGCACCAT	TTAAAGCATC	TAATAGTTTT	900
25	GCATCATCTA	ATGTTTTAAT	AAGCTTGATT	GCTTTTAATA	TACTATCTTT	ATTGCGTGCA	960
	ATTGCGCTCTG	TAACTTCATT	TAACTTTTCT	AACTTAATTT	GTTCTTCTGA	TTTTTCTAAG	1020
	CGTCTAATTT	TAGAAGATAT	TCTCTCAGCC	ATTATTTATC	CACCTGATTT	CCCGGGAAAA	1080
30	CATAATCTGA	ACGTTCCCAT	TTTTTCTGTA	CTTGAACACT	GTAAGCGGT	TGACGTTTTT	1140
	TATTGACACG	GAAATTATTA	GGGTTCAACG	GTGACTTACC	ACGTTTCGTA	ATTACCTCCA	1200
35	AACGACAGCT	AGTACGTTTA	TAAGATGGTG	TATCCGTGTA	TTGATCAACA	TCACTaTTAG	1260
	TTAATAAGTT	AATTGCACCT	AGATCTCCAT	TTTCCATCGC	aTCaTTATTT	AATGGAATAT	1320
	AGATTTCTTT	ACCTTTAACA	CGATCTGTCA	CGTGAAGTTG	TAATACCGCT	TCTCCTGTYT	1380
40	CAGAAATCAG	CTTAACCTCT	GCACCTTCAT	GAATGCCTCT	ATCTTCAGCA	AGCTCTGGAG	1440
	AAATTTCAAC	AAATGCACGT	GGCACTTTGT	ATTTAATCAT	TGGTGTTTGA	TAAGTCATAT	1500
	TACCTTCATG	GAAGTGCTCT	AACAATCGAC	CATTGTTTAC	ATGAATATCA	TAAATTTTCA	1560
45	CTTGCTTAAA	GTAATTATCA	AATGATAATG	GGAATAATTT	TGCTTTACCA	TTATCAAAAT	1620
	TGAATCCTTC	TAAGTATAGA	ATAGGCTCAT	CAGTACCATC	AGGTTGTA	GGCCATTGTA	1680
	AACTATTGAA	TCCTTCTAAA	CGATCATAAC	TTACCCGAGC	ATATAGAGGT	GTTAAGCGTG	1740
50	CTACTTCATC	CATAATTTCA	CTAGGATGCT	TGTAATTCCA	ATCAAATCCT	AATCTATTAG	1800
	CAATTGCTTG	GAAAATTTTC	CAGTCAGGTT	TTKAATCACC	AAGAGGTTCT	AATGCTTGGT	1860

55

EP 0 786 519 A2

	TTGCTGGCAA TACAACATCT GCGTATGTTG CTGTGAATGT TAAAAATTCA TCTTGGA	1980
	CCATGAAATC TAATTTTTC AACGCAGCTT GTACAAAATT AATATTTGAA TCCACAATAC	2040
5	CCGTATCTTC ACCATATAAG TACAATGAGT GTACTTCTCC GTCATGTATA CCTTCTACCA	2100
	TTTCATGATT ATCTTTACCA GCTTTTGGAT TCAATTTAAC GCCATATTCT TTTTCAAATT	2160
	TAGCGCGAAT ATCATCCGCT TCAATACTTT GATAACCAGT AATCTTATCA GGCATACTTC	2220
10	CCATATCACT ACATCCTTGA ACATTATTAT GTCCACGTAA TGGATACGCA CCAGTACCAG	2280
	GACGACGATA ATTACCTGTT ACTAATAATA AGTTTGAAAT CGCTGTACTT GAGTCACTAC	2340
	CAATGTCTTG TTGTGTAATA CCCATTGCCC AACAAATTAC AACAGATTCA GCTTTAGCAC	2400
15	ATTCTTCAGC AAATTTAATC AATTCTGATT CAGGAATACC TGTGCTTCT TCAGCAAAG	2460
	CCATTGTAAA TGTTTCTAAT GATTGTGAAT ATTCATCAAA ATCATCTACC CACTCATCAA	2520
20	TAAATGCTTT ATCGTGTAAT TCATGATCAA TAATATACTT AGTCACTGCA CTTAACCACG	2580
	CTAAATCCGT ACCTGGTTTA GGTGATAAA AACGATCCGC ACGTTCTGCC ATTTTATGTT	2640
	TTCTAATATC AAATACATGT ATTTTTTGAC CAAATAATT TTGTGCACGT TTCATGCGTG	2700
25	ATGCGATAAC TGGATGAGCT TCGGCTGTAT TAGTACCTAT CAATACAGAC ATTGCCGCTT	2760
	TTTCTAAATC TTCAATACTA CCTGAGTCAC CGCCGTGTCC AACCGTTCTA AATAAGCCTT	2820
	TTGTTGCAGG TGCTTGGCAA TATCTTGAAC AGTTATCAAC GTTATTTGTG CCAATAACTT	2880
30	GTCTTGCTAA TTTTTCGATT AAATACGATT CTTTATTCGT CGCTTTAGAA GAAGAAATGA	2940
	ATGATAGTGC ATCTGGGCCA TGCTTTTCTT TAATAGCTGT AAAATTATCT GCAATGACGT	3000
35	TTAAAGCTTC ATCCCATCT ACTTCATGGA ACTCACCATT TTTCTTACT AGTGGTTTAG	3060
	TTAATCGTTG ATCTGAATTA ATATGTCCCC ATGAAAACCT ACCTTTAACA CAAGTCGCAA	3120
	TTTTATTGTC TGGAGAATCA TGTGATGGTT GTACTTTTAA AATTTCTCTA TCTTTAGTCC	3180
40	AAACTTCAAA TGAACAACCC ACACCACAAT AAGTACACAC TGTTTTAGTT TTCTTAATAC	3240
	GCTCTTTACG CATTTCTGCT TCTGAATCTG AGATTGCAAA TAGTGGACCA TAACCAGGTT	3300
	CTGCTTTTTT AGTTAAATCA ATCATTGCTG CTAATGAACC AGGTTCCGTA TCAGTCATAT	3360
45	AACCCGCATT ACCTCCATA TTCACTTCCA TCATGGCATT ACATGGACAT ACCGTCGCAC	3420
	ATTGACCACA AGATACACAT GAAGACTCAT TAATCGGTAC ATCATTATCC CAAATAACAC	3480
	GTGGATGTTT ACGATCCCAA TCAATTCTAA TAGTTTCATT CACTTCGATA TCTTGACATG	3540
50	CTTCTACACA ACGCCACAT AAGATACATT GATTTGGATC ATAACGATAA AATGGGCCGT	3600
	AATCTTTTTT GTATGGCTTC TCTTTATATT CATACGTTTG ATGCTGAAGC CCCCATGCAT	3660

55

EP 0 786 519 A2

	TATGCTTTTC TAAAATTCGA TCAAGCGCTT CTTTTTGAGC ATCTTTCACA TCATTGTTCA	3780
	CAGTATTTAC AGTCATTGGA CGATCAATCA CCGTACTACA TGAACGTTCA ATTTTACCGT	3840
5	CAATCTCAAC AGTACATGTA TCACATGTTT GAATTGGTCC CATCGACTCG TTATAACAAA	3900
	TTGAAGGTAC AAAAGTATCT TGTGATTTAA TAAATTCAAG TAAATTCGTA CCTGGTTCTA	3960
	CAAGATAATC TTTTCCATCA AGTGTAACCA CCAAATGTTC TTGCATATTA CTCACCCCGT	4020
10	CTATATATAT TTTCCGTAAA TGACTTTTAA TAAATTGCTC ATATCCACCT AAAATAACGA	4080
	TGCCCCACAC ATCTTTCAGA TAGAATTAAT TTAATTGTAT TACTTTATGT ACTAGTTGTT	4140
15	AAGTAAATTT TGTATTTTG CCTTTTACA ATCATTTTTA TTTGAAATAT TTTGCGCGAA	4200
	ATTAAATCAT CTTTTTGTTT AATTGAAAAT AATTATCATT ATTAGTTTTC CAATTATCTG	4260
	TTTCACGCTT TTTGCCATAT CTTTCACAAC CTTATTAATG ACAATATTTA ATAATCACCT	4320
20	CACCTAAAAA TCGTTATACT ATTTATAAAT ACCCTTTTTT TGAAAATTAA TAACCCAAGT	4380
	TTGATAATA TCTACTATCA TTTAGAAGGT AATATTTATC TTTAAATTAA ATTTGTAATG	4440
	GATTAATTTA TAAAAATCAA ATCAGGCATT AAATAAAATA GCCCATAAAT ACAAAGTGTT	4500
25	ATCACCTTCT ATTTACGGGC TATTAGTTCT ATTCGTTATT CTATTTACAG ATCATTCTAT	4560
	CTAATTAATT TGTGTACAAT TTTGATAACT TATTTTCCCT TAGTTTACTA CTCTAGATTA	4620
	TCTTTTAATA ACTTAGTACT TTCAGCTTTT GACTGCTCAC TAGGAATGAA GTAGTACAAT	4680
30	CCGTCACTTT GAATGCCGCC TTGACCACTC AATTGATGTT TATTAATCGT GTCATTAGCA	4740
	TCTTTATAAT TGCTTCTAAT CGTATTCAAA TCACCTAATG TTAAATCTGT TTTAACATTA	4800
35	TTTTGAATTT CATTCAATTAG ACTATTAAAA TGTGTAATCG ATGATGGGCT TGCAATCTTA	4860
	TTGGCCATCG CTTCAAGCAC AATTGCTGA CGTTGTTGTC GACCAAAGTC ACCACCAGCA	4920
	CCTTCTTCTT TACGACTTCT AATAAACTTC AATGCTTGAT CACCATTAC ATGTGTCTGC	4980
40	TGTCCTTTTG TAAAACGAAC ACCATCAACA GTGAATGTAT CATTACTTAC TACATCAACA	5040
	CCGCCGATGC TATCTATCAT ATTATGCAAA CCATCCATAT CGATTGTCGC ATAATGATCA	5100
	ATTGGCACAT TCATTAAATTT TTCAAGTGAT TTAACAGCCA TATTTGGTCC ACCATATGCA	5160
45	TAGGCATGTG CAATTTTTC AGTAGTACCA CGGCCAACAA TTTCCGCTCT TGTATCACGC	5220
	GGTATACTTA CTATTTCAAG TTTCTTCGTT TTAGGGTTGA TAGATAAAAT CATAATACTA	5280
	tCACTACGCT CTCCGCCACC CTTTTTCTTA CGATCAGCAT CTGAATCGAC ACCAAATAAA	5340
50	GCGATTGTGA ATGGATCACC ATCGTTTAAA CTCACTTTTT TATCTCTTAA TTCTGAATGA	5400
	TTGCGATCTA ACGGATTGTG TATCTTATTA CCAGTAATAA AAATTTTAGC AGCTACATAC	5460

55

EP 0 786 519 A2

	GGTAGGCTCA	TTTTACTTTT	AGACGAACGT	TTCAATCCCA	CCACTCCTTT	ACTATTCCTT	5580
	ACATACTTTG	TCTGTTTTCT	CTATTTATTA	TATAGTAAAA	TAATTTTTTT	ACTATACTTC	5640
5	TGTAGACGTA	TAACTATTTT	TTATCATTTT	TTATCTCTAG	AGAATATCTA	TCTGTATTTT	5700
	TGATAACCAC	CATTTGCATT	TAAAATTTTA	AGTACCGTTT	CATGACATGC	TTTATTACTT	5760
	ATAATAAAAG	GTGCACCCTT	TAAATGATCA	ATTGCCTTAC	CATCTAAAGT	CGTCATTTT	5820
10	AGATTCAATA	GTTCTGCAAA	TAAAACTGT	GCAGCAATGT	CCCAAGGTTT	AGGATTTGTA	5880
	TTAATATGTG	CCCCAAATTG	ACCTTTTGCC	ACTCGCATAG	AATCTAATCC	GCAAGCACCA	5940
	ACTAAACGAT	AACTAAATGA	GGCGTCAAAT	AAATCTTGCA	CCGTATCTAG	ATTCATCACT	6000
15	TGTGCATTAA	ACGATATAAT	AGCGTCTTCC	AATTTTAACG	ATGGTGTTTC	TTCCATCTTA	6060
	ATTCCATTAC	AAAAAGCACC	TTCTCCTCGT	ATTGCTTTAT	AAAGCTTTTT	ATGCGGATAA	6120
20	TCATATACGT	ACGATAACAT	TGGTTTACCT	TCATAAAAAT	ACGCCAATAT	AATACAATAA	6180
	TCTTCTTGCT	GTTTTACTAA	ATTGGCAGTT	CCATCAATGG	GATCCATAAT	CCATAAATGA	6240
	TTAATTTTAT	TCGTAATCAT	TTCAATTACTT	TTTTCTTCCG	CTAATAGTTG	GTGTTCCGGA	6300
25	AAATGTGTTG	CTAAAAATTG	TTGGAATTGT	TGTTGAATCT	GTTTATCTAC	ATTTGTAAC	6360
	AAATCAAATC	GATGACGCTT	AGTTTCTGTA	GTCATTTCCA	TAATTAATTG	CGGAATAACA	6420
	TTGTCTATTT	GTTTCAACCA	CGAACATATT	AACTTATCTA	TTTGCTGTAA	TGTTTTATCT	6480
30	GTCATTTCTG	CCACCACTTC	TCATATCATT	ATCATTTTAT	TATTACCCTA	TATTAAAAGA	6540
	ATCAACAATA	CAACTGAAGA	CTTCTTCATT	TTATGCATAA	AAAAATCGGC	TAGTCACGTG	6600
	CTAGCCGACA	AATAGAAAGG	AAAGTAAGTA	ATAAATATTG	AAGATGTTGT	GATGTAAC	6660
35	GAACGATTAA	AAGCTATCTG	TTATATAGCT	CTACCCCTTT	GTTTAATCGC	TCCCCCTGTT	6720
	ACAAGTAATA	TCATAGCACA	ATCTTTTTTA	AAATGTAAGC	GTTTTCCACA	AAATTTTATC	6780
40	GATTTTTTAA	AAAAGATATT	GAAAATGTCC	TCATTGTGAC	TCTTATGTTA	TACTTTGTGT	6840
	AATATATCAT	CTTTTAGGAG	GTGGCTGTCA	TGAATAAAGC	TGAAAGGCAA	AATTTAATAA	6900
	TTACTGCAAT	TCAACAAAAT	AAAAAAATGA	CCGCTTTAGA	ATTAGCTAAA	TATTGCAACG	6960
45	TATCCAAACG	CACAATTTTA	AGAGATATTG	ATGATTTAGA	AAATCAAGGT	GTTAAAATTT	7020
	ATGCGCATTAA	TGGGAAAAAT	GGTGGTTACC	AAATACAACA	AGCACAATCT	AAAATTGCAT	7080
	TAAACTTATC	TGAAACACAA	TTATCAGCCT	TATTTTATAGT	GCTTAATGAA	AGTCAGTCGT	7140
50	ACTCGACATT	ACCATATAAA	AGCGAAATCA	ACGCAATTAT	AAAACAATGT	TTAAGTCTTC	7200
	CACAAACACG	CTTAAGAAAA	TTGCTTAAAC	GCATGGACTT	TTATATTAAA	TTTGATGACA	7260

55

EP 0 786 519 A2

	ATGTGATGTT AGTAGATCAT AGGGTTGATG ATAATATTAA AGCTGAAAAC GTTATATTTA	7380
	TTGGCCTTTT GTGTAAACAT GGACATTGGC ATGCAGTCAT TTATGACATT GCTCAAGACA	7440
5	AAACTGCCGA ACTCGAAATT GAAAATATTA TAGATATTTT GTATTCATTG GGTAAGACGA	7500
	TTCAAACCAG AGACATATCC ATTGATAACT ATCATCAATT TTTAAACCCC ATCGATTCCCT	7560
	AAAAACAGC AGTAAGATGA TTTTCAATTA GAAAATATCT TGCTGCTGTT CTCTATTTAT	7620
10	ACAATACTTC GTATTGAATG GntTCGCTTT CCTAGGGTGC CGTCTCAGCC TTGGTCTTCG	7680
	ACTGGCACTG CTCCTCAGG AGTCTCGCCA TTAATACTAC GTATTAACAT GTAATTTTAC	7740
15	TTTGAAATAC TTAaaaaaAT AAAACACTTT GCCCAACTTA CACTACCAAT AGAAACTGCT	7800
	GTTAGAATTC CTCAAAATGA TATTTGCGGA TATGTTAATG AAATTGTTAA AAAGATAGCT	7860
	GATAGCGAAT TCGATGAATT CAGACATCAT CGTGGCGCAA CATCCTATCA TCTAAAAATG	7920
20	ATGTTAAAAA TCACCTCATA TTCATATACT CAATCTGAAT TTTCTGGCCG TAGAATAGAA	7980
	AAATTACTTC ATAACAGTAT TCGAATGATG TGGTTAGCTC AAGATCAAAC ACCTTCTTAT	8040
	AAAACTATTA ATCTTTTtag AGTGAATCCT AATACTGATG CGCTAATTGA ATCTTTATTT	8100
25	ATTcAGTTTC ATAATAAAAT GCATATCAAA AAAGCTGATT TCTATCAAAT AATTAATAGA	8160
	AATCAGCTTT TTTCaTTGCC TAAAACTTA ATGTCCCGAC CTCTTTATCT ACGCATAAAT	8220
	ACTTATTACT GATATAACGA AAGAAACAAA ATTATTGCT ATATGTAATG CAATTGTTGA	8280
30	ACCTAGGTTT CTTCAGATT TTAAATAAGT GAAAACTAAT ATGATGGATA GTATGAGATA	8340
	TGGACCAAAC TCAAACGGCG ACTTTGCATC AGTCACATGA ATAAATGCAA ATAAGAACAC	8400
	CGAAACAATA CTCATAGCTA TAAaATTAAa CTTCTTACCT AATTCTCCAA TTAAaATATG	8460
35	TCTAAATACG ATTTCTTCAA CTATTGGACC TACAATCACA ATTAATAAGA ATGCTACAGG	8520
	TAAaAATGCA GGCACCTCAA ACATTTTATT TAGCTCAAGT TCATTGGCTG TTtCACTATA	8580
40	TTGCAaATGT TTAGGTAGAA ACTGTGTCAT ATATTCATAT GTATAAATTA AGATGAGAGC	8640
	AATAATATAC GTTATTGACA ATCTAAGCCA ATATTTTTTG ATATACGCAA AACCAGCTCG	8700
	AAGCCTTGAT GGCATCACTT TTAAATGAAA TAAATAAAAT GCGCCAATCC CAATCGTATA	8760
45	TGCTAAAGCT TGTGTGATAG TCGCTACAAA TATCAGATTA CTATCGATTT CATAATAACC	8820
	AAACAAAATT GGTCTATGT AAGCTGCAAT TGTGAGTGCA TAAaATATAA CACCTATAAT	8880
	TGGAATTATA AGCAaATCTC TCCATGCTAT ATCTTTAAAC GTGTATTTCT TTTTTTCATT	8940
50	TTCCaCTGTT ATATCCTtTC CTGTTTAAATA ATTGATTTTT GGAGGTACTT CTACATGATA	9000
	AACGAAACTA AGTATATGAG ACAACAAATT ACTAATTGTA TTCAaATCAT TGATACGATT	9060

55

ATAGTTACTA ATGAATTGAA TAAGTTCAAA GGCTTTGAAA CATCATATAT AATAAACGAA 9180
 AATCAAGTTT CCTATTATGA AATTATAACA CTACTTAATA AACGTCCCCT CgACAAGTCG 9240
 5 ACTATGGTAA CAAAATTCAA TATCTTAATT TTTATCATAC AGAACTATCT AACGCATTAT 9300
 TTGCAATTAA ATTTGCCCCAT TAACCTATTT TTCATAAAAT GTCATTTAAA CAAGTTATTT 9360
 ATTAAAATTC ACTTTATTAC ATAAATTATA CAATTArAAA GTTTCTTCAA ATTGTAAAGA 9420
 10 TGCATTAATC GAGTTATAAT CATAATGATT AAGATGGT 9458

(2) INFORMATION FOR SEQ ID NO: 115:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 910 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 115:

AnGCGTATCA TGTCACGCAT TTAACTACT TCTTTACCAC AAGATTATAC AGTCACATTA 60
 25 GTTGATCGTA TGCCATTTCA TGGATTGAAA CCAGAATTTT ATGCTTTAGC TGCGGGCACG 120
 AAATCAGATA AAGATGTTCTG TATGAAATTC CCTAATCATC CACAAGTGAA TACAGTTTAT 180
 30 GGTGAAATTA ACGACATAGA TTTAGATGCT CAAATTGTCT CAGTCGGTAA TTCTAAAATT 240
 GATTATGATG AGCTAATCAT TGGTTTAGGA TGTGAAGATA AATATCATAA CGTTCCAGGA 300
 GCCGAAGAAT ATACACATAG TATTCAAACA CTCTCAAAGG CTCGGGATAC TTTCCATAGT 360
 35 ATTAGTGAAC TACCAGAAGG TGCTAAAGTC GGTATCGTTG GTGCTGGATT AAGCGGCATA 420
 GAACTTGCCA GCGAATTAAG AGAAAGTAGA TCAGACTTGG AAATATATCT TTATGACCGT 480
 GGGC⁶EGCGAA TTTTAAGAAA TTTTCCAGAA AAATTAAGTA AGTATGTTGC GAAATGGTTC 540
 40 GCCAAAAATA ATGTTACCGT TGTTCCAAAT TCAAATATTA ATAAAGTTGA ACCTGGTAAA 600
 ATATATAACT GTGATGAACC TAAAGATATT GATTTAGTTG TATGGACAGC AGGAATTCAA 660
 CCTGTTGAAG TTGTTGTAAG CTTGCCGATT GATATAAATA GTAATGGACG CGTGATAGTT 720
 45 AACCAGTATC ATCAAGTACC AACATATCGT AACGTCTATG TAGTTGGTGA TTGTGCTGAT 780
 TTACCACATG CGCCAAGTGC TCAGTTAGCC GAAGTTCAAG GTGATCAAAT TGCCGATGTG 840
 50 CTTAAAAAGC AATGGCTAAA TGAACCATTA CCTGACAAAA TGCCGGA⁶ACT AAAGGTACAA 900
 GGTATCGTTG 910

(2) INFORMATION FOR SEQ ID NO: 116:

(A) LENGTH: 10182 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 116:

10	TTTTTGATTG AAAGTGGTGA TTAAACAAGC ATTTTAAATA GCAATGATTT GAAAGTCACA	60
	CATGATCCTA CCACTGATTA TTATAATTTA TCTGGTAAGT TGTCGAACGA TAATCCAAAC	120
	GTTAAACAAT TAAACGTAG ATATAATATT CCTAAAAACG CATCAACAAA GGTGGAATTA	180
15	AAGGGAATGA GTGATTTAAA AGGCAATAAT CATCAAGATC AGAAACTTTA TTTTATTTT	240
	TCAAGTCCTG GAAAAGACCA AATCATTTAT AAAGAAAGCC TTACTTATAA TAAAATAAGT	300
	GAACATTAAT ACTTATGCTG TAATTATAGA AACATCCAAA TCATCTATTA NAATCCTATA	360
20	TTATAAAAnC ACCTCACATA ACTCGTTCAA CTGTACCAAA CCACATTACA TTAGATTTTA	420
	GGCTAACTAT TGTGATGTAC ATCAAAAACG AATTTGTGAG GCGTTGTATA TTTTACAAAG	480
25	GTGACTAGCG TTTCGTATAG CATTTC AAC ATTACTACAC TCAAGCGTCA CGCTAAAGTT	540
	CGAAATCGAA TCCTTTCATT CAACAAAAGC TCATATCCAC TACAAACTTC ATATCAAGCG	600
	TATAAACTAT CTTGTGATAC TATCTCGATC ATATCTATAG TATGCATTG TGTTCCGTTT	660
30	CACTGAAGTA TATGTATCAT CAGTTAAGTA TAAACCGTCA TCCTTCAATG TTAATTGATA	720
	AGCATATTTT CGTGCTAACC AGGCAATATC TATATAATTT TCTCCTGCGT TTTCATAACT	780
	TCTTAAATCT TCAATATGTG CACTAACTTC AGGGaAAATG ATTCTAACAA CACTTTCATC	840
35	AACCCAATAT TTGTCATGCA TCCATCGCAC TTGATCTGCC AATAAAGGTA ACTGCACATC	900
	ATTGAAATAT AGACGAAAGC CGTCACTATC ATACATTTGC CGATATGGTA ATGGCTGTTT	960
	TCTAATCACT AACACCTCGC CACCCATTAC GGTGCCTTCT CTAGTATCAT CACTTCCACC	1020
40	CGAAGCTTCA TACGTTGTTG GGTCAACCTG TAGTCCATGT ACATCTCCAA TATAAGCATC	1080
	TGGTTTATGT TCCATTGCAT GTCCATGTGC AATCAATGCT AATATTGTAG ATTGTGAAAA	1140
45	TTGAGGCTCC CATTCAATGC GATTAGGATG GCTACTATAA ATTCTAGGTT CATCTATAGC	1200
	CTGCTGAATA TCCATGCCAA AACTAATAC ATTGATTAAT GTTTGCGCAA CACTAGCAAT	1260
	GATACTTATG GCACCAGGTG CACCTACTGT TAATATTGGC TTCCCGTGAT ACATCACAAT	1320
50	CGTTGGAGCC ATGTTACTTA GTGGTCGTTT ATATGGTGCA ATTTGTTAA TACCACCATC	1380
	TACTACATCA AAGCCATCCA TTGTCGTATT CAATAACACA CCGTAGCCTG GAATCGTGAT	1440
55	ACCTGAACCA TAAATCATAC CAATTGATGT CGTAAATGAA GCAATATTAC CTTCCTTATC	1500

	ATCAGACACA ACACCATGCT CTATATCAAT ATTTGCTTTA TTGCTATCAA TGAGCGTACT	1620
	GCGTGCTTTT AAATAATCAT CATCAATTAA TGACTGTACA GGCACCTCAT GAAAATTATC	1680
5	ATCCGCCAAG TATTGCGCAC GATCACTATA TGCTAAATGC ATCGCTTGTA TCAAATGATG	1740
	CAAGTAATCA ACAGATCTTG GACCCATAGA TGGTAAATCG ACATGTTCTA ATAACITCAA	1800
10	TATTTGAATT ACCGTGATAC CGCCAGAACT AGATGGTCCC ATTGaaATAAA TGTCATAGTC	1860
	TTTAAATGTT GCACTGATTG GCGCTTTAAT CTGAATGTCA TATTTGGCTA GATCCTCTAA	1920
	AGTGATTGTC CCACCACATG CTTTGACAAC ATTGACTAAT TGTTTCGCAA TGTCACCTTT	1980
15	ATAAAATGCA TTAAACCCTT GTTCTCTTAA TATTTGAAAT GTCTTACCTA ATTCGGGTG	2040
	TACAATCCAA TCACCTTCAC GCCAATATTG ATTTTCATGC GTAAATACTT GTGCCGTTTC	2100
	ATGATACTTT GTCAATCGTG CGTGTGCTG GCGCGAATAT TTTTCAGTAG CCCAATTGGC	2160
20	TGCATGACCT TCAATGGCTA GTTCAATTGC AGGATTAATT AAATCTTCCA ATGACAATTT	2220
	AGCATAACGC TTGTGAATAT AATCAAACAG CTTTGGAATT GCTGGCACAG CGACAGTTTT	2280
	ACCATGTGTA GTCATATCAA AAAATGATTT ATATTGCGCT GAATCATCTA GATAAAATTG	2340
25	TTTGTCTACA TGTTCAAGTG CTGTCTCAGG TGCATCAAAC GCAGTTATAC TGCCAGTACT	2400
	TTGCTCATAA TATAGCAAAT ACCCGCCACC ACCAATACCT GATGCAAATG GTTCTACCAC	2460
30	ATTCAATGCC AGTTGAATTG CAATCACTGC ATCCATGGCG TTGCCACCTT GATCTAATAC	2520
	ATCCTTACCA ATTTTAGCCG CAAGAGGATG TGATACGGAA ATTAACCCTT CTTTAGATGT	2580
	TTTTGTCTGT TTGTCAATTA AGTTAATGAC CATACTATAT CCTCCTACTT TCTGTTAAAT	2640
35	ATTTAAACA TTATTGATTA ATGGCTTTTT CTACTTTTTT TAAATCTTGA CGTTGCTCGT	2700
	TACCAGTATC GACAAGTGGT GTAATCGGTG ATGCAATTTT AAATTTATCG CCACGATAAA	2760
	ACTTAATAAA TTGATCCTGA TCTATCGCAT TAACTACTGC TTGTCTCAAG TTTGGATGCG	2820
40	TCTTAAATAT ACCTTTTTTA ATATTTAGCA TTAAAAGAC TGACTTGCGT CCATTTTTGC	2880
	GAATAATGCT TAAATTTTTA TCCGACTTAA TTAAATCAAA ATGTTTTTGA TTCACATCTG	2940
	CCAACATATC AATTGAATGA TTTCTAAGTT CTGACAATGC ATTATTCGGG TCACCATTAA	3000
45	ACTTCAATGT AATATTTTTA ATTTTAGCTG GTCCATAACT ACCTTTTTCT GTTTCGTGA	3060
	ATCCTGGATT ACGTTGAAAC GTTGCTTGAT ATGCATTTTT CTGTGTCATA ATGTATGCGC	3120
50	CACTTGCATA CAGCGCATTT TTCCATCTG AATTGTCAGG AATTGTACTG CTATCCCCAT	3180
	ATCCTTTTGG ATATTCTTGA TTTACTTGAT TAACAAATTT TTTAGATAAA ATGCCTGCCG	3240
	AAGAGTGTGT TAAGTAATTT ACCTCTCGAG GCATCGATTG ATCTGTCGTA ATTTTAACAA	3300

55

	TATAAGCTTT AATCAACTTA TCATAGATTG ATTTATCGTC CTTGTCTTTC TCTTTACGCA	3420
	ACTGATCGAT GTCCTCATCT TTTAATATCT TGATGTCATT TATATGTTTG TGCATATTGT	3480
5	AAGTATTATT GTTAGGCACA GACTTTTTTAT CACGTGCTCT ATCTAAAGAA AACTTAACAT	3540
	CTTCAGCCGA TACACGCTCT CCAGTATTAC GTGCTTGTC ATTGACCACT TTCGCAAAAT	3600
	AATCATCATC TCTTAACAAG AAATAAAATG CTTTATTGTC CTTATTACACA GCATAATCAT	3660
10	GACTTAACGA ACCTTTCGTT GTTAAATGAT CATTTTCATC TAATAATAAT AACCTTGTGT	3720
	ACATATTATC ATTAATTGAA TATACTGACG GCGCAATTGA ACGTATTGGA TCCAATGTAG	3780
	GAATTCACC ATCTTGTTGT GTCATCACAA GTGGCCGCGT ATCTCGTTCT CTACTATTGT	3840
15	TGTAATCAAA TTGTGCCAT ATTAATGCAC GTGAATTTGG CAATCCAACA CTATTTTTAT	3900
	CTAACACTTT ATTGTCATAT ACTAAATTCT TTTTGTATCC ATATAAAGGC GCCATATACC	3960
20	CTTTATCAAA TACAACCTCA TCTTCAATTT GCTTATATGT TTGTTTAAACA TCTGCTTCAT	4020
	TTTGAGTAGA AGCTTTATTT AACAACTGGT CTACATGTTT ATCTTTCAAT AAATAATTG	4080
	ATCCTGTAGA ACTAAATAAT GCCGTCATAG CATAGTTCGG GTCACCAAAC ACTGTCATCC	4140
25	AGTCATCAAT TTGGATATCA TAATTGCCGG CTGACGTTG TGTACGATAG CTACCATAAT	4200
	CTGGTTGGAT ATTCATCTTC ACGTTAAATC CTGCATTTTC CAATTGATCT TTAACGATAT	4260
	TCATATCATT TTCATAACTT GCTTGTCTTA GGAAATGTAT TGTTGGTCGC TCGCCTTTCA	4320
30	CTTCAACTTT CGATGACTTT TGAGCCACTT CTGATTTTCGT AGGGACACCA CAACCACTTA	4380
	ATACCAACGC TAAAACTATA ATTGCGATAC TAATGATTTT CTTACATCT ATCCCTACCT	4440
35	TTTTAATGAA TTCTTGATC TAGTGCATCA CGCACTGCAT CACCTATAAA ATTAAATGCT	4500
	AAAACGACGA ACATAATACA AACACCAGGT ACAATAGCTA AATTACTGTG CGTTTCCAAG	4560
	TAGTTACTAC CGGTACGTAA AATGTTGCCC CATTGAGCTA CATCAGGTGC AACACCAAGT	4620
40	CCTAGGAAAC TTAAACTACT TGTTGTTAAT ACAACCACAC CTATATTAA TGAAAAACGT	4680
	ACAATCATAG GCGCAATCGC ATTCGGTAAA ATATAACGCC ATATGATATT CCAAGTGTTT	4740
	TCACCAGTGA TACGTGCTGC ATCTACATAT TCCATGCGTT TAATTTCTAA AACACTGGCA	4800
45	CGCATTGTCC GTGCAATGA TGGTATATTA CCGATACTTA AAGCAATAAT TAAATTGGA	4860
	ATACTTGCTC CAAATGATGC AATAATTGCC ACCGCTAACA ATAATGATGG AATTGCAAAC	4920
	ACTACATCTA AAATTCGCAT TATTAAATTA TCAATATGAT TAAAATAACC TGCGATAGTG	4980
50	CCTAGTAACA CACCAAAAAT AACTGCAATA ACTACTGAAA TAATTGAAAT TGAAAATGTC	5040
	AGCTTCGTTT CTACAACCTAC GCGTGTAAT AAGTCTCTAC CGAAATCATC AGTACCAAAC	5100

55

	GTATCAAATG TAAATTGTGA CACAATTGAT AATGTCAGCA TGTAGACTAA AATAAGTAAC	5220
	CCGATAATCG CAATACGATG TCTAGTAGTT TTTCTGTATAA ACGATTCCCA CCCGTTATAA	5280
5	CTATGTATTT GCGATGTACG TTGGTAACGT CTAATACTTA CAAACATTAA TAATGTAAAT	5340
	ACGTTGCCTG TTAATGTCAT CAACAATAAC AACACTTCGA CGATACGTCG CCATAGGTCA	5400
	TGATGCTTCC ATGTTTGTTT CGTTGTAAA ATAATAATTA AAATGATGGT TAAAACGATT	5460
10	AGCAATGTTT CAGCAATATA GAACGTATCG GCCACATAAC CTTTAAAAAG ATTTAATGCA	5520
	CTCGTTAATA TAACTAAAAT ATAAGTTGCT ATGGCGTAAC TTGCGAATAA TTTTAAGGAA	5580
	GCTATCTTTG AATTAAGTTG TGCCATATGC CTCACTTCCT TTCGTTGATT TCACTACGTA	5640
15	ATTTTGGATC GATTAAAGCA TAAATATAT CAATAATTAA GTTTGCTAAA GATATTACAA	5700
	TTGATATATA TACGACCCCA CCCATGACTG CTGGAATATC AGGTATTAGT TGTTTTTGGAA	5760
20	CGATATAACG CCCGATACCA TTAATGTTAA ATACTTGTTT CGTCACTGCT GAACCGCCTA	5820
	GTAACCTGTC CACTAGAAGA CCAACTAACG TTACAATTGG AATAATGGCA TTTTTCAAAA	5880
	TATGTTTAAT AACAACTTGT GTCGTCGATA ATCCTTTTGC ATAAGCAGTT AAAACATAAT	5940
25	CGCTGCGCAT TACTTCAAGT ACAGAAGACC TTGTCATACG CGTGATAGAA GCAGCAATAC	6000
	TTGTTCCAAT GACAAGTACA GGTAAATCA ACGATATTGG ATGTTCTGGC ATATAAGATG	6060
	GTGGCAAAAT ATCCAATTTT AATGAGAACG CTAAAATGAA TAATAGCCCT TGCCAGAAAC	6120
30	TTGGAATAGA TAAACCAATT AATGCAATTA TCATTAACGT GATATCAAGC CAACTATTTT	6180
	GCTTCATCGC ACTGATAATA CCAATTGGTA TTGCAATAAT TAATGCCACC ATTAGCGCTA	6240
	ATACTGCGAC AATTATTGTA ATTGGAATTC TTTGCGCAAC TGCTTTAGTC ACAACCTCAT	6300
35	TCCCTTTGTA AGTCGTACCT AAGTCAAAGG TAAAAACACC CTTGATGGTA TCCCACAATT	6360
	GAATZAAATA AGGTTCTGTTA AGATGATGTA ATACATTGAA TTGATGTATC TGTGCCTTTG	6420
40	TTGCATTTTG TCCAGTATG CTATAAGCCG CATCAAGCGG TGAAAAATAC AGAATGGTAA	6480
	ACACACTGAC AATAACACCA ATGATGACAA TCACAGCCAT GACAATTCGT TCAAAAATAT	6540
	ATCTAACTAA TGGCTGTAAA TAAAAAGTCA ATAAGATGAA CATCGGCAAG GCCAATATCA	6600
45	CTTTGATCAT GATGAACCTA TGAAATAATA CATTTTCAAA GTATGTTGAA AAATGTGCTT	6660
	GTTCAATATT CTTTGAATC GTATTAGAAC TTTGTGCCTT GAATATTTTT AATGCTTCTT	6720
	TATGTATTTG TGTGGATGAC TTTTGCTGCG ATAAATATTT ATATTTTGA TGTAACGCCT	6780
50	GTTCAATTTT TGAAATTTCA GAATTATTAG CGTAAAAATT TTTCTCTTA GCAGAAAAGA	6840
	AAAACCTTAT CACTGCATAT AAAAATATTG GCAAGCTTAA TACCGATAAT ACAAACCTGT	6900

55

EP 0 786 519 A2

	CTTGTAATAAT AATCTTGAGT AGATTACTAT GATATACAAA AGTATAGAAT AAATTTACAC	7020
	ATTTGTGaAT AGGGAGGCAC AACATCATGT CAAATTTATT AGAAGTCAAC AGTCTGAATG	7080
5	TACAAITCAA TTATGATGAA ACTACAGTTC AAGCGGTAAA AAACGTCTCT TTCGAATTAC	7140
	GAAAAAACA TATCCTAGGT ATTGTTGGTG AATCAGGATC AGGAAAAAGT ATTACCGCTA	7200
	AATCTATTTT AGGGCTACTA CCAGATTATC CAGATCACAC ATTAACAGGA GAAATTATTT	7260
10	TTAATGGGCA ATCGTTAAAT AATTTATCAA CTTCAGCGTT ACAACAAATT CGAGGTAAGG	7320
	ATATTTCAAT GATTTTTCAT GATCCACTCT CTTCGTTGAA TCCAAGATTA ACGATTGGCA	7380
15	AACAAATTAC AGAAGTAATA TTTCAACATA AACGTGTATC TAAATCTGAA GCAAAGTCGA	7440
	TGACAATAGA CATTTTAGAA AAAGTAGGTA TAAACATGC AACTCGACAA TTTGATGCTT	7500
	ATCCACATGA ACTTTCTGGT GGTATGCGTC AACGTGTCAT GATAGCAATG GCATTGATTT	7560
20	TAAAGCCACA AATTTTAATC GCAGATGAaC CAACAACGGC ATTAGATGCC AGTACACAAA	7620
	ATCAATTACT GCAGTTAATG AAGTCCCTTT ATGAGTACAC AGAAACATCT ATTATTTTTA	7680
	TCACTCACGA TTTAGGCGCT GTGTATCAAT TTTGCGACGA TGTGATTGTA ATGAAAGATG	7740
25	GAAGTGTCTG TGAAGTGCG ACGGTTGAAA GTATTTTTAA ATCGCCACAA CATACTATA	7800
	CAAAACGCTT AATAGATGCG ATTCTGATA TTCATCAAAC GCGTCCGCCA AGACCGTTAA	7860
30	ACAATGATAT TTTATTAAAA TTCGATCGCG TGAGyGgGAT TACACATCAC CGAGTGGCAG	7920
	CCTATACCGA GCAGTTAATG ATATTAACCT GGCTATTAGA AAAGGCGAAA CATTAGGCAT	7980
	TGTCGGTGAA TCAGGGTCAG GGAAATCGAC ATTAGCTAAG ACGGTCGTCG GTCTAAAGGA	8040
35	AGTGTGAGAA GGCTTTATTT GGTATAACGA ATTACCATTA AGTTTATTTA AAGATGATGA	8100
	ATTGAAATCT TTACGACAAG AGATACAAAT GATTTTTCAT GATCCATTCT CATCTATTAA	8160
	TCCAGATTTT AAAGTCATTG ATGTGATTAA ACGACCACTA ATCATTCTAT GGAAAGTCAA	8220
40	AGATAATGAT GACATTATTA AACTGTCTGT ATCGTTGTTA GAAAAGGTTG GCCTAGATCA	8280
	AACTTTCTTA TATCGCTATC CACACGAATT ATCTGGTGGG CAACGTCAGC GTGTAAGTAT	8340
	CGCGAGAGCA CTTGCTGTTG AACCTAAAGT GATTGTTTGC GACGAGGCAG TGTCCGCTTT	8400
45	AGACGTTTCA ATTCAAAAAG ATATCATCGA GTTATTAAAA CAATTACAGT TAGACTTCGG	8460
	CATCACTTAT TTATTCATCA CACATGACAT GGGTGTATC AATGAAATAT GTGATCGCGT	8520
50	TGCAGTTATG AAAAATGGCG AAATCGTTGA ACTGAATAAC ACAGAAGATA TTATCAAACA	8580
	TCCGCAGTCA GACTATGCAA AGCAACTTAT TTCAGAAGTA GCAGTTATTG CTAAATAAAA	8640
55	GTCAATGCGTT GTGCAACTTT ATCACTGTAT GGTCTGAAAT AAATTGCGCG ACTTCTGATG	8700

5 TATCAAGTTT TAGGTGCTTT GCCATGATT AAGAGTCACC CCCATACTTT GGGCATTTTA 8820
 ACGCCAGAAT AAATCCCCCG CCACTATGTG AAGTGTGGGG GATTATTTAT ATTTTATTAG 8880
 AATATTGAGA TTTTGTAGTG TGTCAACTTA GCTTAGTCAA TGTATATTTA ACGTCACTTA 8940
 CTCTTTTCTT TTCATAATTA ACACATTCAA ATAAACTTTG ATCAAAAAAC ACAAAGTTAA 9000
 10 AAGTACCATC TTGTAATATG CTCTCATACA TTATCCCGTC ATATTTAAGG CTTCGAATAT 9060
 AATCAGCTAA ATATTGAAAT GGCAAATAAT CTATTCCTTG TTCATCGCTT GGATTTGTTA 9120
 TTCCTTTATG AATCTTTTTT AATGTTTGGT AATTTACAAA ATACTTTCTA AATCCATCAT 9180
 15 CGCCAGCTTT GATTGCATTA CTAGTTAAAT TAGTTAAATT CGCAATTTTC AATTTCTCTT 9240
 TTGTCACGTT TTTTGTAAAC TTAACCTTAC CTATATAAAT AATGTCATTA TGCTTAGGTT 9300
 TAACTTCTTC TATACTGACC TGTTCTTTTG TACTAAGGTA TAATACGCTT ATCCATTAG 9360
 20 AATTCAATCT TCCTGCCGTT GCAAATCCCT TTGGTGGTGA CATTAGTTCA CTTTCTCTG 9420
 TAATGAACTT AACTATTCTA GATCTATATA ATGGTTCAAA TCTTCTCTA AATTCCTCAA 9480
 TACTATAGTA ATTAGTAGTG ATATCGAGAA AGAACGCTAA ATTCTCTAAA TTGATCATAT 9540
 25 TTTTATGAAA TCTATTTTTA TACTTCAAGC TCTCAGAAA TCCATCCCAG TCATTATTG 9600
 CTACAATTAG ATTTTATTTT GTATATTTT TATCGTTTAT GATTTTAGCG CCTACTAAAT 9660
 30 CTTCCAACAC TCGTCTATCT AAATTTTCAT CATCTTTAAA AAGTTCATTT AAAATACAAC 9720
 TTATTTGAGC TTCCTCAACA TTAAATATAC TCCAGTCGTC TTTAATGCT ATTTCAATCT 9780
 TTTTACCTTC TTTTGGGCTA AAAGTATCTG GTAAATTTAT ACTAATATCA TATAATTCTA 9840
 35 ATGCTGGTCT TAAATAATCT CTAATAAGTT CTAATTTATC TATGTCCTTA GTCGTATCAA 9900
 ATATTTTAAC ACCAAGATGA TTGTTATCAA TATCACAATT GTCAAATTTG CTATTTATCA 9960
 TTTGCAATGA TTTCTACGAT TTCAGTATTA TTAAAACATT TTTCACATAT TTTCATTTTG 10020
 40 AGACTCCAAG TATCTATTCA TAATTTCTAG GTGATGCATG ATAGATAACC TTTTAATTAA 10080
 ACCTAATCCT GGATaCTTAT TATTTTCATT TAATTCTTCA AATTGTCCCA AGCGCATAAG 10140
 ATCTATTTTT AATATCTAAG TTTTTTGACC ATGTTACTAA TT 10182

(2) INFORMATION FOR SEQ ID NO: 117:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 3491 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

EP 0 786 519 A2

AACTCAGGCA ATTGAAACAG CATTAGGTGC TTCATTACAA CATGTCATTG TAGATTGAGA 60
 AAAAGATGGA CGCCAGGCTA TTCAATTTT AAAAGAACGT AATTAGGTC GTGCGACGTT 120
 5 TTTACCATTA AATGTTATAC AGAGTAGAGT GGTAGCGACT GATATTAAAT CTATTGCTAA 180
 AGAGGCAAAC GGATTTATTA GTATCGCTTC GGAAGCAGTT AAAGTAGCAC CAGAATATCA 240
 AAATATTATC GGAATTTAT TAGGTAATAC GATTATCGTT GATCATTTAA AGCATGCAAA 300
 10 TGAATTGGCA CGTGCATTAA AATATCGAAC TCGTATTGTT ACTTTGGAAG GTGATATTGT 360
 AAATCCTGGT GGtTCTATGA CTGGTGGTGG CGCTCGTAAG TCAAAAAGTA TTCTGTCTCA 420
 AAAAGACGAG TTGACAACAA TGAGACACCA ATTAGAAGAT TACTTGCGTC AAACAGAATC 480
 15 ATTTGAACAA CAATTTAAAG AGTTGAAGAT AAAAAGTGAT CAATTAAGTG AACTGTATTT 540
 TGAAAAAGT CAAAAGCATA ATACACTTAA AGAGCAAGTG CATCATTTTG AAATGGAGCT 600
 20 CGATAGATTA ACTACACAAG AAACACAAAT AAAAATGAT CATGaAGAAT TCGAATTTGA 660
 AAAAATGAT GGTATACGA GTGACAAAAG TCGACAACT TTGAGTGAAA AAGAACTTA 720
 TCTAGAAAGT ATTAAGCAT CTTTAAACG ACTAGAAGAT GAAATTGAAC GCTACACAAA 780
 25 ACTTTCTAAA GAAGGTAAGG AAAGCGTTAC TAAACACAA CAAACCTTAC ATCAGAAACA 840
 ATCTGATCTT GCTGTGGTTA AAGAGCGTAT TAAACACAA CAACAGACAA TAGATCGATT 900
 AAATAATCAA AATCAACAAA CTAAACATCA ATTAAAAGAT GTTAAAGAAA AAATTGCATT 960
 30 CTTTAATTCTG GATGAAGTGA TGGGCGAACA AGCTTTTCAA AATATTAAAG ATCAAATTAA 1020
 TGGTCAACAA GAAACGAGAA CACGCTTATC AGATGAATTA GATAAATTGA AACAAACAG 1080
 35 TATTGAGTTG AATGAACAAA TCGATGCGCA AGAAGCTAAA CTACAAGTTT GTCACCAAGA 1140
 TATTTTAGCT ATCGAAAATC ACTACCAAGA TATTAAAGCT GAACAATCAA AGCTAGATGT 1200
 ATTAATTCTAT CATGCGATAG ATCATTaAAT GATGrATATC AATTGACTGT TGAACGTGCG 1260
 40 ArATCTGAAT ATACGaGTGA TGrATCGATg ACGCATTACG TAAAAAGTT AAGTTAATGr 1320
 AGaTgYCGAT TGATGrACTA GGTCTGTAA ACTTAAATGC AATTGAACAA TTTGAAGAGT 1380
 TAAATGAACG TTATACATTT TTAAGTGAAC AACGTACAGA TCTTCGTAAA GCTAAAGAAA 1440
 45 CATTAGAGCA AATTATAAGT GAAATGGATC AAGAGGTTAC TGAAAGATTT AAAGAACTT 1500
 TCCATGCTAT TCAAGGACAT TTTACAGCTG TGTCAAACA ATTGTTTGGT GGAGGCGATG 1560
 CAGAATTGCA ATTAAGTGA GCGGATTATT TAACAGCTGG TATTGATATT GTGGtACAAC 1620
 50 CACCGGGTAA AAAGTTGCAA CATTTATCGT TACTGAGTGG TGGTGAGCGT GCATTAAGTG 1680
 CTATTGCTTT ACTATTGCA ATTTTAAAG TAAGATCTGC ACCTTTTGTT ATATTAGrTG 1740

55

EP 0 786 519 A2

	TATCAGACGA AACACAATTC ATTGTTATTA CACACCGTAA AGGAACAATG GAATTTGCAG	1860
	ATAGGTTATA CGGTGTAACA ATGCAAGAAT CAGGTGTTAC TAACTTGTG AGTGTGAATT	1920
5	TAAATACAAT AGATGATGTG TTGAAGGAGG AGCAATAATG AGCTTTTTTA AACGCTTAAA	1980
	AGATAAGTTT GCAACAAATA AAGAAAATGA AGAAGTTAAA TCCTTAACAG AAGAACAAGG	2040
10	TCAAGACAAA TTAGAAGATA CACATTCTGA AGGTTCAACG CAGGACGCAA ATGATTTAGC	2100
	AGAAAATGCT GAAGTGAAAA AGAAGCCACG CAAGTTGAGT GAAGCGGATT TTGATGACGA	2160
	TGGCTTAATA TCAATTGAAG ATTTTGAAGA AATTGAAGCT CAAAAAATGG GTGCTAAATT	2220
15	TAAAGCAGGA CTCGAAAAAT CTCGTCAAAA TTTCCAAGAA CAATTAAATA ATTTGATAGC	2280
	GAGATATCGT AAAGTAGATG AAGACTTTTT TGAAGCTTTA GAAGAAATGT TAATCACTGC	2340
	AGACGTCGGT TTTAATACAG TGATGACGTT AACTGAAGAA TTACGTATGG AAGCACAACG	2400
20	ACGTAATATT CAAGATACTG AAGATTTGCG TGAAGTCATT GTTGAAAAGA TCGTAGAGAT	2460
	TTACCATCAA GAAGATKATA ATTCAGAAGC TATGAACCTA GAAGATGGTC GTTTAAATGT	2520
	CATTTTAATG GTTGGTGTGA ATGGTGTGG TAAACAACA ACAATTGGAA AATTAGCTTA	2580
25	CCGATATAAA ATGGAAGGTA AAAAAGTAAT GTTAGCTGCG GCGGATACTT TTAGAGCGGG	2640
	TGCTATTGAT CAATTGAAAG TTTGGGGCGA ACGTGTGGT GTAGACGTAA TTAGCCAAAG	2700
	TGAAGGTTCT GATCCAGCTG CTGTTATGTA TGATGCGATT AATGCGCTA AAAACAAAGG	2760
30	TGTTGATATT TTAATCTGTG ATACCGCTGG ACGTTTACAA AATAAmACAA ATCTAATGcm	2820
	AGAATTAGAA AAAGTTAAGC GTGTAATTAA TCGAGCAGTG CCAGATGCGC CTCATGAAGC	2880
35	ATTACTATGT TTAGATGCTA CAACTGGTCA GAATGCGTTG TCACAAGCTA GAACTTTAA	2940
	AGAAGTAACA AATGTTACAG GTATTGTATT AACGAAATTA GATGGTACAG CCAAAGGTGG	3000
	TATCGTATTA GCCATTCGTA ATGAATTGCA CATCCAGTT AAATATGTAG GTTTAGGTGA	3060
40	GCAATTAGAT GACTTACAAC CATTTAACCC TGAAAGTTAT GTCTACGGCT TATTCGCTGA	3120
	TATGATTGAA CAAAATGAAG AAATAACAAC AGTTGAAAAT GATCAAATTG TAACAGAAGA	3180
	AAAGGACGAT AATCATGGGT CAAAATGATT TAGTtAAAAC GTTACGAATG AATTATTTGT	3240
45	TTGATTTTaT CAATCCTTAT TGACGAATAA ACAACGTaAT TATTTGGAAT TATTTTATCT	3300
	TGAAGATTAT TCTTTAAGTG AAATCGCAGa TACTTTTAAT GTGAGTAGaC AAGCAGTTTA	3360
50	TGATAATATA AGAAGAACTG GCGATTTAGT TGAAGATTAT GAAAAGAAAT TGGAATTATA	3420
	CCAGAAATTT GAGCAACGCC GAGAAATATA TGATGAAATG AAACCACATT TAAGTAATCC	3480
	AGAACAAATA C	3491

55

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 4253 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 118:

10	AGTACGTTTT ATAATTATAA GTACGTAATT AACATATTAA CATATCGCAA GTATGTATTT	60
	AAATAAgATT GTTATAATTT CAAAGTTCAT CCAAGaTTAT GGC GTTTGCA TTTACCTATT	120
15	AAAAACGTTA TTATATCAAA GATGCGAAAG ATAATACGGG TTTATTTTAT GAAAGTGAGA	180
	AGGATAAAAT GGATAATGAG CAACGCTTAA AAAGAAGAGA GAATATAAGG AATTTCTCGA	240
	TTATAGCACA TATTGACCAC GGAAAATCTA CATTGGCTGA TAGAATTTTA GAAAATACCA	300
20	AATCAGTTGA AACAAAGAGAT ATGCAAGATC AGTTACTAGA TTCAATGGAT TTAGAAAGAG	360
	AACGTGGTAT TACAATCAAA TTAAACGCgT ACGTTTAAAG TACGAAGCTA AAGATGGAAA	420
	TACTTATACA TTCCATTTAA TCGATACGCC TGGACACGTC GATTTTACAT ATGAAGTGTC	480
25	ACGTTcTTTG GCAGCTTG TG AGGGCGCGAT TTTAGTAGTA GATGCGGCTC AAGGTATCGA	540
	AGCACAAACA TTAGCAAATG TTTATTTAGC ATTAGATAAT GAGTTAGAGT TATTGCCTGT	600
	TATTAACAAA ATTGATTTAC CTGCTGCAGA ACCTGAACGC GTGAAACAAG AAATGAAGA	660
30	TATGATAGGT TTAGACCAAG ACGATGTTGT TTTAGCAAGT GCTAAATCTA ACATTGGAAT	720
	TGAAGAGATA CTAGAGAAAA TAGTTGAAGT TGTGCCAGCT CCAGATGGTG ACCCAGAAGC	780
35	ACCACTAAAA GCGTTAATAT TTGATTCTGA GTATGATCCA TATAGAGGGG TAATTCATC	840
	GATAAGAATT GTGACGGTG TTGTTAAAGC CGGAGATAAA ATTCGAATGA TGGCCACTGG	900
	TAAAGAGTTC GAAGTAACAG AAGTTGGAAT TAATACACCT AAGCAGCTTC CAGTTGATGA	960
40	ATTAACAGTT GGTGATGTTG GTTATATTAT TGCAAGTATT AAAAATGTTG ATGATTCTAG	1020
	GGTTGGTGAC ACCATCACAT TAGCTAGTAG ACCTGCATCA GAACCATGTC AAGGTTATAA	1080
	GAAAAATGAAT CCAATGGTAT ATTGCGGACT GTTCCCAATA GATAACAAAA ATTATAATGA	1140
45	TTAAGAGAA GCATTAGAAA AATTACAATT GAATGATGCA TCATTAGAAT TTGAGCCTGA	1200
	ATCGTCACAA GCATTAGGTT TTGTTATAG AACTGGTTTC TTAGGTATGT TACACATGGA	1260
	AATAATTCAA GAAAGAATTG AAAGAGAATT TGGTATTGAA TTAATTGCAA CTGCACCATC	1320
50	TGTAATTTAT CAATGTGTTT TAAGGGACGG TTCAGAAGTG ACGGTTGATA ACCCAGCACA	1380
	AATGCCAGAT CGTGATAAAA TTGATAAAAT ATTTGAGCCA TATGTTCTGT CAaCTATGAT	1440

55

EP 0 786 519 A2

TATAAATATG GACTATTTAG ATGATATTCG TGTAAATATT GTTTATGAAT TACCTTTAGC 1560
 TGAAGTTGTA TTTGATTTCT TCGATCAACT TAAATCTAAT ACTAAAGGAT ATGCATCATT 1620
 5 TGATTATGAA TTCATCGAAA ATAAAGAAAAG TAATTTAGTC AAGATGGATA TTTTATTAAA 1680
 TGGTGATAAA GTGGATGCGC TAAGCTTCAT AGTTCATAGA GATTTTGTCAT ATGAACGTGG 1740
 TAAAGCATTG GTTGAAAAAC TTAAAACGTT AATTCCAAGA CAGCAATTG AAGTACCTGT 1800
 10 ACAGGCTGCA ATAGGACAAA AAATTGTAGC GCGTACAAAT ATTAAATCAA TGGGTAAAAA 1860
 CGTTTTAGCT AAATGTTATG GCGGTGACAT AAGCCGTAAA CGTAAATTAC TTGAAAAACA 1920
 15 AAAAGCAGGT AAAGCTAAGA TGAAAGCAGT TGGTAATGTT GAAATTCCAC AAGATGCTTT 1980
 CTTGGCTGTA TTGAAAATGG ATGATGAATA ATTTTAAAAA ATCAATTAAC AATTTACAAT 2040
 GAATAAAGTT TAATAACTAA AAAGAGGGAG CCTAGGATAA ATTAACGTCC TGGGCTTTAC 2100
 20 AATGTTATAT TGGCAGCCAT CGACAGAGTT AAAATGAGCT TATAACAATG GGGCCCCAAC 2160
 ACAGAAGCTG ACGAAAAGTC AGCTTACTAT AATGTGCAAG TTGGGGTGGG GCCCCAACAT 2220
 AGAGAATTTT GAAAAGAAAT TCTACAGGCA ATGCAAGTTG GGGTGGGACG ACGAAATAAA 2280
 25 TTTTGGCGAA ATATCATTTT TGTCCCACTC CTTTATGCAT GAGTTTACT CATGTAATTT 2340
 TATTTTAAAG GACATATTAC ATCTGGCTAA TGTGTAAGAG CCACTACATA ATAAATCATT 2400
 AGTGGTTCTT TATTATTTCT ATCTCACTCC CTCTAAACAA GAATAAATAT TAAAATGAAT 2460
 30 CGATATATTA GACAATCATT GATTAAACGT TAAAGTTAAA AGTAAGAATA ATTGCAGATA 2520
 GTCCAACAGG ATATAGCCGA TTGGATAAAA AGTCTGAGAA GCGGGGCATT AAAATGACGG 2580
 35 TACAAAGTGC ATATATACAT ATTCCATTTT GTGTAAGAAT ATGTACATAT TGTGATTICA 2640
 ATAAATATTT TATACAGAAT CAACCTGTAG ATGAGTACTT AGATGCACTA ATCAGAGAAA 2700
 TGTCTACAGC AAAATATAGG ATCTTAAAGA CCATGTATGT AGGTGGCGGC ACACCAACGG 2760
 40 CCCTTTCTAT TAATCaGTTG GAAAGATTAC TTAAAGCAAT ACGTGATACG TTTACAATCA 2820
 CAGGCGAGTA TACATTTGAA GCAAATCCTG ATGAGTTAAC TAAAGAGAAA GTCCAATAT 2880
 TAGAGAAATA TGGAGTAAAA AGGATTTCAA TGGGCGTTCA AACATTCAAG CCGGAGTTAT 2940
 45 TGTCTGTTTT AGGTAGAACG CACAATACTG AAGATATTTA CACTTCGGTG TTAAATGCTA 3000
 AAAACGCAGG TATTAAATCA ATCAGTTTAG ATTTAATGTA TCATTTACCG AAACAGACGA 3060
 50 TTGAAGATTT TGAACAAAGT TTAGATCTAG CTTTAGATAT GGATATTCAA CATATTTCTGA 3120
 GTTACGGCTT AATACTTGAA CCTAAAACCC AATTTTATAA TATGTATAGA AAAGGCTTGC 3180
 TCAAACCTGC TAATGAGGAT TTAGGTGCTG ACATGTATCA GTTGCTGATG TCTAAGATAG 3240

55

AACATAATAA GGTTTACTGG TTTAATGAGG AATATTATGG ATTTGGAGCA GGTGCAAGTG 3360
 GTTATGTAGA TGGTGTGCGT TATACGAATA TCAATCCAGT GAATCATTAT ATCAAAGCTA 3420
 5 TAAATAAAGA AAGTAAAGCA ATTTTAGTAT CAAATAAACC TTCTTTGACT GAGAGAATGG 3480
 AAGAAGAAAT GTTTCTTGGG TTGCGTTTAA ATGAAGGTGT GAGTAGTAGT AGGTTCAAAA 3540
 10 AGAAGTTTGA CCAATCTATT GAAAGTGTCT TTGGTCAAAC AATAAATAAT TTAAGAGAGA 3600
 AGGAATTAAT TGTAGAAAAG AACGATGTGA TTGCACCTAC AAATAGAGGG AAAGTCATAG 3660
 GTAATGAGGT TTTTGAAGCT TTCCTAATAA ATGATTAAAA AAAATTGAAA TTTCGAGTCT 3720
 15 TTAACATTGA CTTACTTTGA CCAATTTGAT AAATTATAAT TAGCACTTGA GATAAGTGAG 3780
 TGCTAATGAG GTGAAAACAT GATTACAGAT AGGCAATTGA GTATATTAAA CGCAATTGTT 3840
 GAGGATTATG TTGATTTTGG ACAACCCGTT GGTTCATAAA CACTAATTGA GCGACATAAC 3900
 20 TTGAATGTGA GTCCTGCTAC AATTAGAAAT GAGATGAAAC AGCTTGAAGA TTAAACTAT 3960
 ATCGAGAAGA CACATAGTTC TTCAGGGCGT TCGCCATCAC AATTAGGTTT TAGGTATTAT 4020
 GTCAATCGTT TACTTGAACA AACATCTCAT CAAAAACAA ATAAATTAAG ACGATTAAAT 4080
 25 CAATGTGTAG TTGAGAATCA ATATGATGTA TCATCAGCAT TGACATATTT TGCAGATGAA 4140
 TTATCAAATA TATCTCAATA TACAACCTTA GTTGTTTCATC CTAATCATAA ACAAGATATT 4200
 ATCAATAATG TACTTGTAT TCGTGCTAAT CCTAATTTAG TTATAATGGT TAT 4253
 30

(2) INFORMATION FOR SEQ ID NO: 119:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 3395 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear
 35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 119:

TCCCTAATCG AACAAATTA TGCGCATAAA CAAAGTAGAT TGATATAAAA TTCTTAATTA 60
 TCAGAATATA TTTACAAATC TGAATTTTAT TAGTATATTG GTTAGTATTTC ATAGAGGCAT 120
 45 GACGGTATTT GAGCAGGATT TTAAATCGGg ATTTTATAAT CGATTTAAGA GAGGCCACTT 180
 TGCTTGcACA TTAATACTGT CAATGGGAGG GGAATGTATA TGAGTrAAGC ACATCAATTA 240
 AITCAAGAGG ATGAACATTA TTTTGCGAAA TCAGGACGTA TTAAATATTA TCCGTTAGTG 300
 50 ATTGATCATG GATATGGAGC AACATTGGTT GATATTGAGG GGAAGACATA TATCGATTTG 360
 TTATCGAGTG CGAGTTCTCA AAACGTAGGT CATGCACCTA GAGAAGTAAC AGAAGCGATA 420
 55

EP 0 786 519 A2

GTACGTTTAG CTAAGAAGCT TTGTGAGATT GCACCTGGAG ATTTTGAAAA AAGAGTGACC 540
 TTCGGATTAA CCGGATCAGA CGCAAATGAT GGCATCATT AATTTGCCAG AGCATATACA 600
 5 GGGCGTCCTT ATATCATTAG TTTCCTAAT GCATATCATG GTTCAACTTT TGGCTCATTG 660
 TCTATGTCAG CTATTAGTTT AAATATGCGC AAACATTATG GTCCGTTATT GAATGGTTTT 720
 10 TATCATATTC CGTTTCCAGA TAAATATCGT GGTATGTACG AGCAGCCACA AGCTAATTCA 780
 GTAGAAGAAT ATTTAGCACC CTTAAAAGAA ATGTTTGGCA AGTATGTACC TGCTGACGAA 840
 GTAGCATGTA TTGTTATTGA AACGATACAA GGCATGGTG GACTTTTAGA ACCAGTTCCA 900
 15 GGGTATTTTG AAGCGTTAGA AAAGATTGTG CGTGAACATG GTATTTTAAT CGCTGTCGAT 960
 GATATTC AAC AAGGTTTTGG GAGAACAGGT ACATGGAGTT CAGTCTCGCA TTTTAATTTT 1020
 ACGCCTGATT TAATCACTTT CGGAAAATCC TTAGCAGGTG GTATGCCTAT GTCAGCAATT 1080
 20 GTTGGACGCA AAGAGATTAT GAATTGTTTA GAAGCACCAG CACATTTATT TACAACAGGT 1140
 GCTAATCCAG TTAGTTGTGA AGCTGCATTA GCCACAATTC AAATGATTGA AGATCAGTCG 1200
 CTTCTTCAGG CTAGTGCAGA AAAAGGGGAA TATGTTAGGA AACGAATGGA TCAATGGGTA 1260
 25 TCTAAATACA ATAGTGTAGG CGATGTTAGA GGTAAAGGTC TGAGCATTGG TATTGATATT 1320
 GTTTCGACA AAAAATCAA AACACGTGAT GCCAGTGGG CACTTAAAT TTGTAATTAC 1380
 TGCTTTGAGC ATGGCGTAGT TATTATAGCT GTAGCAGGAA ATGTGTTGCG ATTCCAACCG 1440
 30 CCATTGGTAA TAACATATGA GCAATTAGAC ACGGCGTTAA AACTATAGA AGATGCACTG 1500
 ACTGCTTTGG AAGCAGGTAA CTTAGATCAA TATGACATAT CTGGACAAGG TTGGTAATAG 1560
 35 CGATTATCTT AATATAAAT AAAAATCAT TTCCACATCT GGATGTTAAT CAGATGGGAA 1620
 ATGATTTTTT TTATTTTTTA TTTTGGTGGG TGGTATTCAG CTACGTCATT TTTCTTAGAA 1680
 TGTGTAAGTC CATAACTTAA ATATAGGATG ATACCAACAA TAAACCAAT TAAAGTGAT 1740
 40 AATTTGCTT CGAATCCTAA TCCCAGAAAT ACTAGCAATA CTAAACAAA TGTAATTGCT 1800
 GGTAACACAG GATATAAAGG TAATTTAAAT GCAGGAATTG GTAGATCTTT ACCTTACGC 1860
 TTTCTCAAAC GATACATTGC TAATGAAACG AACATAAATG CAACAAGTGT ACCTGCTGAA 1920
 45 ATTAATTGTG CTAAAAATGC GAATGGGAAC ATAGAACCAA TTAAACACC AATAATAGTA 1980
 AGTATACTA GTGCGCGATT AGGTAAATGT TTGTCGTTTA AGTGGCTTAA CCATGAAGGT 2040
 AATAAGCCGT CACGTCCAAA TGAATAAAGT AAACGTGAGC CTGCTAACAT CATACCAATT 2100
 50 AATGCTGTAA ACATACCGAT AACAGAGATA GCTTGAACAA TAGCTGCTAC AACACCATGA 2160
 CCACTTTGAC GTAAAGCCCA ACCAACAGGT TCAGCATTGT TTGCGTATTG TGAGTAATGG 2220

55

CCAAGAATAC CTCTAGGCAT TGTCTTTTGA GGATCAAGTG CTTCTGCTGA GTTTGCTGCG 2340
 ATAGAATCGA AACCGATATA CGCTAAGAAA ATCATTGAAA CACCAGCATA TATGCCTTGC 2400
 5 CATCCACCAA AGTCACCTGT AGCAGTTACT TTGTGTTCTG GAATAAATGG CACATAGTTA 2460
 CTAACATTTA TTGCTGTTAA ACCTACGATG ACAAATAAAA TAATAGCTAA TACTTTTAAA 2520
 10 ATAATAAAA TATTTTCCAT ACGAGCTGCT TCCGACATAC CACGTGATAG TAATAATGCA 2580
 GTTAATAAAA TAACGATAGC AGCAATAATA TCGATAAAAC CGCCATTTGT ACCAAATGGA 2640
 TTTGATAATG CTGCAGGTAA TTCGATGCCA ATTGGTTTCA CAAGTCCGCG TAAATTCGCT 2700
 15 GAGAATCCTG ATGCAACAAA GGCTACGGCG ATAAATATT CAGCTAATAG AGCCCAACCG 2760
 GCAACCCATC CAAAAAATTC ACCAAATAAT ACATTGACCC AAGAATAGGC TGAACCTGCA 2820
 AATGGCATAG CGGCAGCCAT TTCTGCATAA GTAAATGCAA CTAAACCAGC AACAAATAGCA 2880
 20 GCGAGTAAGA ATGATAACGC AACGGCCGGT CCTGCATGTT CTGCAGCAAC AATGCCAGGT 2940
 AGCGTAAAGA TAGATGTGCA TACAATTGTT CCTACACCTA AAGCTAAGAA ATCACGCACC 3000
 CGAAGTGTAC GCTTTAAATG ACCATCTTTA TTTTGATAGA TAGCCGGATC CTCTTTTCGT 3060
 25 GCTATTTTAT TGAAAAAAT TCCCATAAAC TTTCCTCCCA AACATTCTA AACAAATCTA 3120
 TACGGTGT TTAAATATGT TATATCATAG CACAAATAAT CAATATTTTG TCTAAAAATT 3180
 CTGAAAAATC ACAACTTTAT GTTACGTATT AATGACTTGT CTTGATAACA TCCATAGATT 3240
 30 TTTTAAATGA TAAACTGAT TATAACAGAT ATTAAATGAA TAAGTACTAT TTTTGTGCAA 3300
 TTTTCTAACA ATTTTGACA TTATATGTTT AAAATCAATT TCATGTTTAT GGTCTGATTG 3360
 35 GCTAGTGTGT ATGAAATGTA ATCTTTTGAC TnnGA 3395

(2) INFORMATION FOR SEQ ID NO: 120:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13508 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 120:

ATCAGGTAAT GCCATGCGTT TAGCTGAAAA TTTTTCAGA ACGTTTAAAGT GATATCGGAC 60
 ATCAAGTTGT TTTGATGTCA ATGGATGAAT ATGATACGAC AAACATCGCG CAGTTAGAAG 120
 50 ATTTATTTAT TATTACGTCT ACTCATGGTG AAGGAGAACC GCCTGATAAT GCATGGGATT 180
 TCTTTGAATT TTTAGAAGAC GATAACGCAC CTAATTTAAA TCATGTGAGA TATTCAGTAC 240

	TACTAGAAAA TCTAGGCGCT GAGCGTATAT GTAAGCGTGT AGATTGTGAT ATTGATTATG	360
	AAGAAGACGC AGAAAAGTGG ATGGCAGACA TCATTAATAT TATTGATACC ACATCAGAAG	420
5	GTATTCAAAG TGAATCGGTG ATAAGTGAAT CAATTAAGTC TGCCAAAGAA AAGAAATATT	480
	CTAAATCAAA TCCATACCAA GCAGAAGTAT TAGCGAATAT CAATTTAAAT GGTACCGATT	540
10	CAAATAAAGA AACACGACAT ATAGAATTTT TACTTGATGA TTTTAGTGAA TCATATGAAC	600
	CAGGAGATTG TATAGTAGCA TTACCGCAAA ACGACCCTGA ATTGGTTGAA AACTAATAT	660
	CCATGTTAGG TTGGGATCCG CAATCTCCGG TGCCAATTAA TGATCATGGT GATACAGTTC	720
15	CTATTGTTGA AGCACTAACA TCACATTTTG AATTTACTAA ATTAACATTG CCATTATTGA	780
	AAAATGCAGA TATCTATTTT GACAATGAAG AATTATCTGA ACGTATTCAA GATGAGTCAT	840
	GGGCGCGTGA ATATGTTATA AATCGGGACT TTATAGATTT AATAACAGAT TTTCCAATA	900
20	TAGAATTACA ACCTGAGAAT ATGTATCAAA TCCTTAGAAA ATTACCACCA AGAGAGTATT	960
	CGATTTCTAG TAGTTTTATG GCAACGCCAG ATGAAGTGCA TATTACCGTT GGTACGGTTC	1020
	GTTATCAAGC ACATGGACGT GAGAGAAAAG GTGTATGCTC GGTTCATTTT GCTGAGCGAA	1080
25	TTAAACCAGG CGATATAGTA CCAATTTATT TGAAGAAAAA TCCGAAGTTC AAATTTCCGA	1140
	TGAAGCAAGA TATACCGGTT ATTATGATTG GACCAGGTAC TGAATTGCT CCTTTTAGAG	1200
	CATATTTACA AGAACGTGAA GAACTTGGTA TGAAGTGGAA AACATGGTTG TTCTTTGGTG	1260
30	ATCAACACCG TAGTTCTGAC TTTTATATG AAGAAGAAAT AGAAGATGG CTTGAAAATG	1320
	GAACTTAAC ACGCGTAGAT TTAGCATTTT CAAGAGACCA AGAACACAAA GAATATGTAC	1380
35	AGCATCGTAT AATGGAAGAA AGTAAACGTT TCAATGAATG GATTGAGCAA GGCGCACAA	1440
	CTATATTTGT GGCGATGAAA AATGTATGGC GAAAGATGTC CATCAAGCCA TTAAAGATGT	1500
	ATTGGTAAAA GAACGTCATA TTTCTCAAGA AGAAGCAGAG TTATTATTGC GACAAATGAA	1560
40	ACAACAACAA CGCTATCAAC GTGATGTTTA TTAGCGATTG GTGTTAAATA TTTTAAGGTG	1620
	TAATGATGTA AAAAGATATA AAGGATGTTG CTCAACATGA ATATGCCATT AATGATAGAT	1680
	TTAACAATA AAAATGTCGT CATAGTTGGT GGAGGCGTCG TTGCAAGTCG TCGGGCACAA	1740
45	ACATTAAATC AATACGTTGA ACATATGACG GTCATCAGTC CGACAATCAC TGAAAACTT	1800
	CAAAATATGG TAGATAACGG TGTCGTCATA TGGAAAGAAA AAGAATTTGA ACCAAGCGAT	1860
	ATTGTAGACG CGTATCTAGT TATTGCAGCA ACCAATGAGC CACGTGTCAA TGAAGCGGTA	1920
50	AAAAAGCCT TACCTGAGCA TGCCCTTTTT AATAATGTTG GAGATGCATC AAATGGCAAT	1980
	GTTGTATTTT CAAGTGCACT ACACCGCGAC AAGCTAATA TCAGTGATATC AACTGATGGT	2040

55

	TACAGTTCGT ATATCGACTT TTTATATACT TGCCGACAGA AAATAAAAGT ACTTGATATA	2160
	ACATATAACG AAAAGCAACA GTTACTGTCA CAAATTGTGT CACAAGAATA TTTAAATCAT	2220
5	GACAAACAAG CTCAATTTTT AGCGTGGTTG GATGTAAGAT AATAATAGCG GACCGTCTAA	2280
	CCGTCTAAGG TAAGTCTTCT TATTTTAACT TTAACGCTTA ATCATTGAAA TTAAGACATG	2340
	GGCGGCTTTG TGAATAGTCT AATAATGAAG GATTTAAGCG ATAATGATAT GCGTTTTAAA	2400
10	TATGAATATT ACAATAGAGA AAAAGATACG TAGAACAAAC TTAATAAAAT AGGTGGATAA	2460
	ATTGAAATCT GGTGAAGTC GTTACTATCA TAGCGACCTT TAGCCAGATT TTTTGTGCAA	2520
	TAGAAAGCAA TAATAAAAT GATAGATCAA AATGAAATAC AGGACAGGAT ATACAAGGAT	2580
15	TAGTCATGCC ATGTTATCAA GTAGGAAAAT CAACTTCAC TATTGATAGT TACGCAAAAA	2640
	AGATTTTTTT GATAAAATGA GATAACTTAA ATATAAAAAA TTATATTAAT TATAATATTT	2700
20	AAGTTAAAGA GGGGATTAT GTAAATTGTA TTAAAAGTGG AGGGAGAAAA TAATATGAAT	2760
	AGTGATAATA TGTGGTTAAC AGTAATGGGG CTCATTATTA TTATTTCAAT TGTAGGTTTA	2820
	CTCATTGCCA AAAAGATAAA TCCAGTTGTA GGTATGACAA TCATACCTTG CTTAGGGGCA	2880
25	ATGATTTTAG GATATAGTGT GACAGATTG GTTGGATTTT TTGCTAAAGG GTTAGATCAA	2940
	GTCATCAACG TTGTTATTAT GTTTATCTTT GCCATTATTT TCTTTGGCAT CATGAACGAT	3000
	AGTGGTTTAT TCAAGCCGCT TGTCAAACGC TTAATATTAA TGACACGAGG CAATGTCGTC	3060
30	ATTGTCTGTG CAATGACAGC TTTAATTGGC ACAATAGCCC AATTAGATGG GGCCGGTGCG	3120
	GTAACATTTT TGCTTTCTAT TCCTGCATTA TTACCTTTAT ATAAAGCGTT AAATATGAAT	3180
	AAATATTTAT TGATTTTACT ATTAGCATTA AGCGCGGCGA TTATGAACAT GGTACCTTGG	3240
35	GGAGGTCCAA TGGCTCGTGT AGCTGCAGTG TTAAAAGCCA AAAGTGTCAT TGAATTATGG	3300
	TATGGATTAA TACCTATTCA AATAATAGGT TTCATTCTTG TTATGTTGTT TGCGGTATAT	3360
40	CTTGGATTTA AAGAACAGAA ACGTATCAAA AAAGCAATAG AGAGAAATGA ATTACCGCAA	3420
	ACACAAGATA TAGATGTACA TAAATTAGTT GAAGTATATG AACGAGATCA AGATGTAAGG	3480
	TTTCTGTAA AAGGACGTGC AAGAACAAAA TCATGGATAA AATGGGTGAA TACAGCTTTA	3540
45	ACTTTAGCTG TTATTCTATC GATGTTAATA AATATTGCGC CACCTGAATT TGCATTCATG	3600
	ATAGGTGTTy CGTTGGCACT TGTTATTAAT TTTAAATCAG TGGATGAACA AATGGAACGA	3660
	TTAAGAGCgC ATGCGCCGAA TGCATTAATG ATGGCTGCAG TGATTATTGC AGCAGGTATG	3720
50	TTTTTAGGTG TACTAAATGA AACC GGATG CTTAAAGCGA TTGCGACCAA TTTAATCAAA	3780
	GTGATTCCTG CAGAAGTAGG ACCATACTTG CATATTATTG TAGGTTTACT TGGCGTACCA	3840

55

EP 0 786 519 A2

ACAGCAGGGC AATTTGGTGT ACCGTCTGTA TCAACAGCTT ATTCAATGGT CATAGGGAAT 3960
 ATTATAGGTA CATTGTGCAG CCCATTTTCA CCAGCCTTAT GGTGGCAAT TGGTTTAGCA 4020
 5 GAGGCAAACA TGGGCACGTA TATTAAGTAT GCATTCTTTT GGATTTGGGG ATTCGCTATC 4080
 GTTATGTTAG TAATTGCAAT GTTGATGGGC ATTGTGACGA TTTAAGTATG AAAAAATAGA 4140
 AACTATGGTC ACGTTGCAAA ATGAAATAAT AGTTGCATAA ACATGTCGAA ATGACGGACG 4200
 10 AATCTTTAAA CAATTTTAAA AATTAATGAA ATAATTGTGT AGAAATATGA ATTTCACTAA 4260
 ATGTTAATAA CTTTGTGACG TTTTAGTTAA CAGACTAATA AAAATTTGAA AATACTATAT 4320
 ATAGTGGTAT AACGTAATGA GTAGACACAA TATATAGGAA GAAGGGGTAA AATGAATCAA 4380
 15 ATCGAAGAAG CATTAAACGGG TTTGATTTCT AAAGATCCTG CTATTGTTAA CGAAAATGCT 4440
 AACAAAGATA GTGATACATT TTCAACAATG AGAGATTTAA CAGCAGGTAT CGTTTCTAAA 4500
 20 TCTTACGCAT TAAATCATTT ATTACCAAAG CACGTTGCAG ATGCACATCA AAGAGGGGAC 4560
 ATACATTTTC ACGACTTAGA TTATCATCCA TTCCAACCGT TAACTAACTG TTGTTTAATA 4620
 GATGCTAAAA ATATGCTACA TAATGGATTT GAAATAGGCA ACGCGAATGT AACTTCACCA 4680
 25 AAATCAATAC AACTGCATC AGCGCAGCTT GTACAAATTA TAGCCAATGT TTCTAGCAGT 4740
 CAATATGGTG GCTGTACGGT TGACCgCGTT GACGAATTAC tTAGTACATA TGCACGACcA 4800
 TAATGAAGAA CAACATAGGA ATATsCGCAA AGCAATTGT CAAAGAATCT GAAATTGATC 4860
 30 GTTATGTTGA TCAACAAGTC ACTAAAGACA TCAATGATGC GATTGAAAGT TTAGAATATG 4920
 AAATTAATAC CTTATATACA TCTAATGGAC AGACACCTTT TGTAACATTA GGATTCGGCT 4980
 TAGGTACAGA TCATTTAAGT CGCAAAATTC AACAAGCTAT CTTAAATACT CGTATCAAAG 5040
 35 GCTTAGGAAA AGACCGCACG ACAGCGATTT TCCCGAAACT TGTATTTTCA ATTAAAAAAG 5100
 GAACCAACTT TAGTCCGCAA GATCCGAACT ATGACATTAA ACAACTAGCA TTAAAGTGTT 5160
 40 CAACGAAACG TATGTATCCA GATATTTTAA ATTATGACAA ACTCGTAGAA ATATTAGGTG 5220
 ATTTCAAAGC GCCAATGGGT TGTCGTTTCAT TTTTACCAAG TTGGAAAGAT GCGGAAGGTC 5280
 ATTTTGAAAA TAATGGTCGT TGTAATCTTG GTGTGTTTAC ACTTAATTTA CCTAGAATGG 5340
 45 CATTAGAATC TGCCGGTAAT ATGACGAAAT TCTGGGAAAT CTTTATGAA CGTATCGATG 5400
 TGTTACATGA TGCATTACTT TATCGTATAA ATCGTTTGAA AGATGCTGTA CCGAATAACG 5460
 CACCGATTTT ATATAAAAGT GGCGCATTTA ACTATAAATT AAAAGAAACA GATGATGTTG 5520
 50 CTGAGTTATT TAAAAATAAA CGTGCAACGA TTTCAATGGG CTATATAGGG TTGTATGAAA 5580
 CAGCTACTGT TTTCTATGGT CCAGACTGGG AAACATCTCA AGAAGCAAAA GCATTTACGC 5640

55

	GGTTCAGTAT TTmCAGTACG CCGAGTGAAT CGCTAcGGAT CGTTTTTGTC GTTTAGACCA	5760
	AGAGAGATTG GGAGATATTA AAGACATTAC AGATAAAGGA TATTATCAAA ACTCTTTCCA	5820
5	TTATGATGTA CGTAAAGATG TTACACCTTT TGAAAAGTTA GATTTTGAAA AAGATTATCC	5880
	TTATTATGCG AGTGGTGGTT TCATTCACTA TTGTGAGTAT CCGAAATTGC AACACAATTT	5940
10	GAAAGCACTA GAAGCGGTAT GGGACTACTC TTATGACAAA GTTGGTTACT TAGGTACAAA	6000
	TATTCCGATT GATCATTGTT ATGAATGTGA TTACGATGGA GATTTTGAAAG CAACTGAAAA	6060
	AGGATTTAAA TGCCCGAACT GTGGCAATGA TAATCCTAAA ACAGTTGATG TCGTTAAACG	6120
15	AACATGTGGT TACCTAGGCA ATCCAGTTCA ACGTCCAGTA ATTAAAGGCC GTCATAAAGA	6180
	AATTTGCGCA CGAGTAAAC ATATGAAAGC GCCTAAAGAA TGATACTTTT AGACATTAAA	6240
	CAAGGACAAG GTTATATTGC TAAAATAGAA TCAAATAGCT TTGTTGACGG TGAAGGAGTA	6300
20	AGATGCAGTG TTTATGTATC AGGATGTCCA TTAAATTGTG TTGGATGTTA TAACAAAGCC	6360
	TCACAAAAGT TCAGATATGG CGAGAAATAC ACTGATGAAA TATTAGCAGA AATATTAGAT	6420
	GATTGCGATC ATGATTATAT ATCTGGGCTA AGTCTATTAG GTGGCGAACC ATTTTGTAAT	6480
25	TTGGATATTA CATTAAATCT TGTCAAAGCA TTTGAGCAC GTTTTGGAAG TACAAAGACA	6540
	ATTTGGGTAT GGACTGGATT TTTATATGAA TATTTAGCAA ATGATTGTAC AGAACGTCGA	6600
30	GAGTTATTAT CATACATTGA CGTTTTAGTA GATGGTCTAT TTATACAACA CTTATTCAAA	6660
	CCTGATTIAC CATATAAAGG TTCITTAAT CAACGCATTA TAGATGTACA ACAATCACTC	6720
	TCGCATGCCG GTATGATTGA ATATATAGTT AGTTGAATAT GTATTAGAAG TCAAGGTAAC	6780
35	ATTCGTTGCC TTGGCTTCTT TTTAGGTTAG GTACATAATT GAAAGTTAAT AAAAGCAATT	6840
	CTTTATAAAA ATATATTGAT AGAATATGAC CTAACAATCA TTTTGATACC AATACTAAAA	6900
	GTTG ⁶ CATATC CGTTTTTTAA AAAAGTTGAA AGAGAAAAGT GGTATTTTAG TGGGAAGGAA	6960
40	GTCTAACTTT TTGGTAGCGT TTTACAATAA ATAAATATTC GTTAATAACG TATAAATATT	7020
	CTTAAATGCC ATTCTAGTAA AATTTGTAA ATTCGTTAAA TCGTAACTTA AACTGTTAT	7080
	TTTAGCGCTA TTAAGGTTTT GTTTATTACG GGAAAAATTA TATAAATATT CAATAATTGC	7140
45	CAAGTTTCAA ATTGTATGAA ATTTGCATTA TTATTAAATG TTAGTTATTG TCAATTTTGT	7200
	GAATCAATAT AATTATTACA TTTTGAGATA AATCGAAACA GGATTCATAA AATTAATAAT	7260
	TAGGGGGAGC ACAATTGAAA AAAGAGAAAG TTATGGACTG GACGACCTTT ATAGGGACAG	7320
50	TAGCTGTACT TCTTTTTGCA GTTATACCTA TGATGGCTTT TCCAAAAGCA AGTGAAGATA	7380
	TCATCACTGG TATTAATAGT GCCATTTCTG ATTCAATTGG TTCGATATAT TTATTTATGG	7440
55		

EP 0 786 519 A2

	TTGGTAAAGC AAGTGATAAA CCAGAATTTA ATACATTTAC ATGGGCGGCA ATGCTGTTTT	7560
	GTGCAGGCAT AGGCTCTGAT ATTTTATACT GGGGCGTTAT TGAATGGGCT TTTTACTATC	7620
5	AAGTTCCACC AAATGGCGCG AAAAGTATGA GTGATGAAGC ACTCCAATAT GCGACGCAAT	7680
	ATGGTATGTT CCACTGGGGG CCAATTGCTT GGGCTATTTA TGTCTACCA GCATTACCAA	7740
10	TTGGTTATTT AGTATTTGTT AAAAAACAAC CGGTGTATAA AATTAGTCAA GCTTGTCGTC	7800
	CGATTTTAAA AGGTCAAACA GATAAATTG TAGGTAAAGT TGTAGATATC TTATTTATCT	7860
	TTGGATTGCT AGGTGGTGCG GCAACATCAC TAGCGTTAGG TGTGCCATTA ATTTCTGCAG	7920
15	GCATAGAAAG ATTAAGTGGT TTAGATGGTA AAAATATGAT TTTACGTTTCGCCATTTTAT	7980
	TAACAATCAC GGTATATTT GCCATTAGTT CATATACAGG ATTGAAAAA GGTATTCAAA	8040
	AGTTAAGTGA TATCAACGTT TGGCTATCCT TTGTACTTTT AGCCTTTATA TTTATTATTG	8100
20	GACCGACTGT TTTTATTATG GAAACGACAG TGACAGGGTT CGGAAATATG TTGAGAGATT	8160
	TCTTTCATAT GGCAACATGG TTAGAACCAT TCGGTGGTAT TAAAGGTCGA AAAGAAACGA	8220
	ATTTCCCACA AGACTGGACA ATATTCTACT GGTCATGGTG GTTAGTATAT GCGCCATTTA	8280
25	TCGGTTTATT TATCGCTAGA ATTTCAAAAG GTCGACGCCT TAAAGAAGTC GTGCTAGGAA	8340
	CAATTATTTA TGGAACGCTT GGATGCGTAT TATCTTTGG TATTTTGGT AACTATGCTG	8400
	TGTATTTACA AATTTCTGGA CAGTTTAATG TAACACAATA TTAAATACA CATGGTACAG	8460
30	AGGCAACCAT TATTGAAGTG GTGCATCATT TACCATTCCC ATCATTGATG ATTGTACTAT	8520
	TCTTAGTATC TGCTTTCTTA TTCTTAGCAA CAACATTGTA TTCGGGTTCA TATATTTAG	8580
35	CGGCAGCATC TCAGAAAAA GTGGTAGGCG AACCATTACG TGCCAATCGT TTATTCTGGG	8640
	CATTTGCATT GTGCTTATTG CCATTTTCAT TGATGCTAGT TGGTGGTGAA CGTGCATTAG	8700
	AAGTATTGAA AACTGCTTCA ATACTGGCAA GTGTGCCATT AATTGTTATT TTTATTTTCA	8760
40	TGATGATATC ATTTTAAATC ATTTTAGGGC GCGATAGAAT TAAACTTGAA ACGCGTGCTG	8820
	AAAAATTAAA AGAAGTTGAA CGTCGTTTAT TGCGAATCGT TCAAGTATCa GAAGAAGAAC	8880
	AAGACGATAA TTTATAATTC AAAGCGGGTC TGGGACGACG AAATGaATTT TGTGAAAATA	8940
45	TCATTTCTGT TCCaTTCCCC TTTTITTAGT AGCATTGTAG GATGAACTTT TAGGTTTTCa	9000
	TTAATGTTGT ACTAAAAGAT TTAATTTTTT AGTGCTCCAA GTACTTATTT ATTGTATGAA	9060
	GCATATTCTA AATCGAAGTT TGAAAGACTC TCATTGATTA TTAAATTAAA TAAAGGGTAT	9120
50	GCGTATGTAC AATTCAAATT AATCGAAGGA TGAAATAAAA TGAATAATCA ATTTAAAAAT	9180
	AAACAGTCCA AATTACATGA CAGTTTAGAA TCCATCACAA AAAACTTATA TGCGACACCT	9240

55

	ACAGAATATT GTTATCTATC ATTCCGGACA CTTAGGTGAC TCCCAACAAG ACATTGCATC	9360
	ATTAGGTGGT GTTTCAAAAG TATTGATGAA TCATGATCAT GAATCTATAG GAGGTTCTAA	9420
5	TCAAGTTGAA GCCCCTTACT TTATACATGA AAATGATGTG GCTGCACTGA AACATAAGAT	9480
	TTCTGTTCAA AAACAATTTA GTAATCGTGT AATGTTGGAT AAGGATTTAG AAGTTATTCC	9540
10	CGCGCCTGGA CATAACCAG GGACGACACT ATTTTATG GATGATGGTC ATCACCGTTA	9600
	CTTATTTACT GGAGATTTTA TATGTTTTGA AGGGAAGAGA TGGCGTACAG TTATATTAGG	9660
	TTCAAGTGAT AGAGAAAAAT CTATTCAAAG TTTAGAGATG GTTAAAGAAT TAGATTTTGA	9720
15	TGTACTTGTA CCTTGGGTGA CTATCAAAGA TGAACCGTTA GTTTATTTTG TAGAAAATGA	9780
	ATATGAAAAA CGTGAACAAA TACAAAATAT TATTGATAGA GTACGTGAGG GCGAGAATAG	9840
	CTAATTGAAA TATATTGGCG AAGCAATGTA ACGAATCTAA GAAAGCCCTA GAAAATACCT	9900
20	CCATAATTGA TTGTCATATA AAACAAAAAC GGTAATTTCT ATTTATTGAG ATAGAAATTA	9960
	CCGTTTATTT CGTGGACCTA TTGCATTGTT TTTATCATGC ATAATCATCA TTGTCGTTGT	10020
	TTGAGTCAAT TTTAATTTTC AGAATCAGAA GGCTGTTCTG GAATTGGGAA ATATTTGAAA	10080
25	ATTTACCCGC TTTCAATCGC TTCGGTTAAC TGTTCTAACC ATTCGTAATA AACATGTGTA	10140
	TGATCAAGCT GAGCTTTAAT TTTTGTGCC TCTTGTTTT CAGCTTCAGT TAAATCACTG	10200
	CTTCAAGTA ATGGATTGAT AATAGCTTGA GCATCTTTTA CTGCTTCGAC ATTGATGTCA	10260
30	ATTTACGCT GGAATTTTTT AGTGAAAAAG TTTCGAAAA AGATGAAAA GTCTTTCTCG	10320
	GCGATAAAAT GTTGTTCGCG GCTTCCTCTC GTAAATGTG GTTTAACAAT ATCAAATTCC	10380
35	TGCAATTTCT TAACGCCAGC ACTCATACTT GGTTCGCTCA TTTGCAATTG ATGACGCATT	10440
	TCATCAAGCG TCATACTGCC TTCAAACACC ATTGCGCCAT ATAAGTTTCC TACACTTCTA	10500
	TTAGTGCCAT ACAAATCCAT TGTCTGTCCA ATTGAATTAA TTACAATATC TTTTGCTTGT	10560
40	TCTAATTGTT GCTGTTTGT CTGAGAACGA GTCATATTG CACCTCCGTA CATCATTTTG	10620
	GTCACGTTAA AATAAATACT AATACATTAT AAAACCTTTT CTAAAAAAG ACATTAAAAA	10680
	TATTTAAAGC ATTAAAGTTA AATGTTTCGT TAAATAAAAA TCTAACGAAC TTACAAACT	10740
45	TAATTCCTGA GTTGTTTTGT AAATGACAC ATTTTTCATT TCTATGCTAA CATAAGTTTG	10800
	TAAAATTcGT TAAATAAAAA TTTAACAAAC TTAACGGrGG TTGTTGAakG GrACTTTTAA	10860
	aACATTTATC TCAGCGTCAA TATATTGATG GTGAGTGGGT TGAAAGCGCG AATAAAAATA	10920
50	CAAGAGATAT TATCAATCCT TACAATCAAG AAGTGATATT TACGGTTTCT GAAGGGACAA	10980
	AAGAGGATGC AGAACGTGCA ATCTTAGCTG CAAGACGTGC GTTTGAGTCT GGTGAATGGT	11040

55

	AACATCgCGA AgCgTTAGCA CGATTAGAAA CATTAGATAC TGGAAAAACG TTAGAAGAAT	11160
	CATATGCAGA TATGGATGAT ATTCATAATG TGTTTATGTA TTTTGCTGGA TTAGCAGATA	11220
5	AAGACGGTGG CGAAATGATT GATTACACCA TTCCAGATAC AGAAAGCAAA ATTGTTAAAG	11280
	AACCAGTAGG TGTAGTTACA CAAATTACAC CTTGGAATTA TCCGTTATTA CAAGCATCAT	11340
10	GGAAAATTGC GCCAGCGCTT GCTACGGGTT GTTCACTAGT TATGAAACCA AGTGAAATTA	11400
	CACCATTAAAC AACAAATACGT GTTTTTGAAT TAATGGAAGA AGTTGGTTTC CCTAAAGGAA	11460
	CAATTAATCT TATTCTAGGT GCAGGTCTG AAGTTGGTGA CGTAATGTCA GGTCATAAAG	11520
15	AGGTTGACCT TGTATCATT ACAGGTGGCA TTGAGACTGG TAAGCATATT ATGAAAAATG	11580
	CTGCTAATAA TGTTACGAAT ATTGCCTTGG AACTTGGCGG TAAAAATCCA AACATTATCT	11640
	TTGATGATGC TGATTTTGAA TTGGCAGTAG ACCAAGCGTT AAATGGTGGA TATTTCCATG	11700
20	CAGGTCAAGT TTGTTCAAGCA GGATCAAGAA TATTAGTACA AAACAGTATT AAAGACAAAT	11760
	TTGAGCAAGC ACTTATTGAT CGCGTGAAAA AAATCAAATT AGGTAATGGT TTTGATGCTG	11820
	ATACTGAAAT GGGACCAGTG ATTTCAACAG AACATCGTAA TAAGATCGAA TCTTATATGG	11880
25	ATGTAGcTAA AGCAGAAGGC GCAACAATTG CTGTTGGTGG TAAACGTCCA GATAGAGATG	11940
	ATTTAAAAGA TGGTCTATTC TTCGAGCCAA CAGTCATTAC AAATTGTGAT ACGTCAATGC	12000
30	GTATTGTACA AGAAGAGGTT TTCGACCTG TCGTACTGT AGAAGGCTTT GAACTGAAC	12060
	AAGAAGCGAT TCAATTAGCG AATGATTCTA TATATGGTTT AGCAGGTGCT GTATTTTCTA	12120
	AAGATATTGG AAAAGCACAA CGCGTTGCTA ACAAGTTGAA ACTTGAACG GTGTGGATTA	12180
35	ATGATTCCA TCCATATTTT GCACAAGCGC CATGGGGTGG ATACAAACAA TCAGGTATCG	12240
	GTAGAGAATT AGGCAAAGAA GGCTTAGAAG AGTACCTTGT TTCAAAACAC ATTTTAACAA	12300
	ATACAAATCC ACAATTAGTG AATTGGTTTA GCAAATAAAA ATTAGATAAG GTGAGTGCCA	12360
40	TTGTAAGAAC ACAAGACACT CACTTTGTTT TGTATAAGTG GCGAAATGTT GATTGATAAT	12420
	TTGGAATAAA CGCAAAATGA ATCATAGATT ATTTCAATTAC TGTTAGTAAC AATCGTAAAA	12480
	GGAAAAGCGA GTGTTTGGT TAGCTAAGTT TAGCAATTCA ACGATAACCA ATCAGCCACT	12540
45	AACAAATATT TCATGCAATA CTCACCTTGA AATACAACAA ACTTTGGAGG TCATAACGAT	12600
	GAGTAACAAA AACAAATCAT ATGATTATGT CATCATTGGA GGAGGCAGTG CAGGTTCTGT	12660
	ACTAGGTAAT CGTCTGAGTG AAGATAAAGA TAAAGAAGTC TTAGTATTAG AAGCGGGTCG	12720
50	CAGTGATTAT TTTTGGGATT TATTTATCCA AATGCCTGCT GCGTTAATGT TCCCTCAGG	12780
	CAATAAATTT TACGATTGGA TTTATTCAAC AGATGAAGAA CCACATATGG GCGTCGTAA	12840

55

TCAACGTGGT AATCCAATGG ACTATGAAGG CTGGGCAGAA CCAGAAGGTA TGGAACTTG 12960
 GGATTTTGCG CACTGTTTAC CGTATTTTAA AAAATTAGAA AAAACATACG GTGCAGCGCC 13020
 5 TTATGATAAA TTTAGAGGCC ATGATGGACC AATTAAGTTA AAACGAGGGC CAGCAACGAA 13080
 TCCTTTATTC CAGTCATTCT TTGATGCAGG TGTGAAGCA GGCTATCATA AAACACCTGA 13140
 TGTGAATGGA TTTAGACAAG AAGGTTTTGG ACCGTTTCAT AGTCAAGTAC ATCGTGGTCG 13200
 10 CCGAATGTCA GCTTCAAGAG CATATTTACA TCCAGCGATG AAGCGTAAAA ACTTAACCGT 13260
 TGAAACACGT GCCTTTGTAA CTGAAATTCA TTATGAAGGT AGAAGAGCAA CTGGTGTTAC 13320
 15 GTATAAGAAA AATGGCAAAC TACATACCAT CGATGCTAAT GAAGTCATTT TGTCTGGTGG 13380
 GGCATTCAAT ACGCCACAAT TACTACAATT ATCTGGTATC GGTGATTCAG AGTTCCTAAA 13440
 ATCAAAAGGC ATTGAGCCAC GTGTTTATTT ACCTGGTGTG GGTGAAAACT TTGAAGATCA 13500
 20 CTTAGAGG 13508

(2) INFORMATION FOR SEQ ID NO: 121:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 7646 base pairs
 25 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 121:

GTAAGTATTG TCTTGATTTC CTAATAAAGT TATATCTTGT AATTCATCTT GTTGACGGCC 60
 35 ATGTGCCATA TAAAGCGCTC CTTTAAATTT ATTTTTTTAT TATTTTGGCG TCTCGGCGTG 120
 CTTTTTCAAA CATGTAATAA CTTGCACCGA TAATAACGAC GTAACCTAAT GTTGCATAGA 180
 AATCTGGAGA TTCTCCGAAT AGAATAAATC CAAGTATTGC TGTGAAAATT ATAGATGCAT 240
 40 ACGTAAAAAT AGAAATATCT TTTGCTGCTG CAAAACCTATA TGCTAAAGTA ACACCAATTT 300
 GACCCACAGC GGCAgCTAAG CCAGCCCCTA ATAGATAAAG TATTTGCATC TGACTCATTG 360
 GTTCATAAGT ATATGCAGTG AAAGGTATTA AAACGATGAC AGAAAATAAG GAGAAGTAAA 420
 45 ATACTATAGT ATATGGTGCT TyTCTTGTA TAAGTGCTCG AACACATGTA TATGCTGATG 480
 CTGCAAAAAT ACCTGAGAAT AAGCCAGCTA ATGATGGAAT CATAGATGAT GAAAATTCAG 540
 GTTTCATAT TAAnAGCAaC CTAAAATAGC AATTATCATT GCTGTAATTT GaTACTTCCT 600
 50 TACCTTTTCA TGtAAGAAA CAATGCTTaA TAAAATCGTC CAGAAAGGAT TGAGTTTCAT 660
 TAATGAATCG GCATCACTAA GTACCATATG ATCAATGGCA TAAATATTTA ACAATACACC 720

55

	TGGCTGATGG TATTTATATA TAAAAAATAA TGGAATAAAC ATTGCTACTA AGTTTCGTGC	840
5	TAATGATTTT TGAAAAACAG GAAGGTCACC TGCAAGCTG AAAAACAACG ACATAAAACT	900
	GAAACCAATA GCCGAAATTA AAATGGCAAT GATACCTTTT ACTTTAGGAT TCAATTTTAT	960
	CGCCTCTTTT ATATAAAATT AACGTATTTA TATTAGCATA AAACAACATG TTGTGCATAA	1020
10	ATAGTTGAAA TTTACTATAA AAAGACTATA ATAGACTGTA GCGAACAAAC GTTCTGTGTT	1080
	TATTTGTCGG AATAATAGGG CATTACACTT TTATGAATGT TTGTGTTATT ACATAAAACA	1140
	AATATCAATT CAGTATCAAG CTAATAAGCT TTTTCTTGAT TTCTGTTGAT ACAATTGAGA	1200
15	TTGACACAGA TTTAAAAAAA TCAAGTGATA TCTACTAAAA AATTTTTTTA AATTGTTCA	1260
	AGTTTTTCTA ATTTAGTATT GGTGCCTAGT TGGAACGTTT TACGAACATT CGATTAGAAA	1320
	ATGGCACTTT AAATCATAGT GTGTCTTATG TATAATGAAA CACATAATAT AGTGTGGTG	1380
20	AAACGAAAAA gACACAATAT CTTGTGTTTT GTATGCAAAT GCTTTATTTA TGAAGAAATT	1440
	ACATTTAAAA GTAATTTAAC ACAGAAATTT AATAGTTATT ATCAATTAAT AGTCATATTT	1500
	TTAGAAAATG TACTGAGCAA ATGGAAGATA TCCAATGATG TAAACACTAC ATATAGTGAT	1560
25	TTTTATACAT TCAACCCATA TAAGCTACTA TTTTCTCAAA TATAAATCTA TGCAATTGGT	1620
	TTACATTTGA GAAAATAAGT AGCTTCATTA TAGTTAATAC AATGCTGAGA TAACCATAGT	1680
30	AACCATGTTG TTAAAGCATT TTTTAATTGG AATGACTACT TTATTTAAAA GGTTGAAGA	1740
	AAGAAGGTGA TCCAATGAAA ATAATATATT TTTCATTTAC TGGAAATGTC CGTCGTTTTA	1800
	TTAAGAGAAC AGAACTTGAA AATACGCTTG AGATTACAGC AGAAAATTGT ATGGAACCAG	1860
35	TTCATGAACC GTTTATTATC GTTACTGGCA CTATTGGATT TGGAGAAGTA CCAGAACCCG	1920
	TTCAATCTTT TTTAGAAGTT AATCATCAAT ACATCAGAGG TGTGGCAGCT AGCGGTAATC	1980
	GAAATTGGGG ACTAAATTTT CAAAAGCGG GTCGCACGAT ATCAGAAGAG TATAATGTCC	2040
40	CTTTATTAAT GAAGTTTGAG TTACATGGAA AAAACAAAGA CGTTATTGAA TTAAAGAACA	2100
	AGGTGGGTAA TTTTAATGAA AACCATGGAA GAGAAAAAGT ACAATCATAT TGAATTAAAT	2160
	AATGAGGTCA CTAAACGAaG AGAAGATGGA TTCTTTAGTT TAGAAAAAGA CCAAGAAGCT	2220
45	TTAGTAGCTT ATTTAGAAGA AGTAAAGAC AAAACAATCT TCTTCGACAC TGAAATCGAG	2280
	CGTTTACGTT ATTTAGTAGA CAACGATTTT TATTTCAATG TGTTTGATAT TTATAGTGAA	2340
50	GCGGATCTAA TTGAAATCAC TGATTATGCA AAATCAATCC CGTTTAATTT TGCAAGTTAT	2400
	ATGTCAGCTA GTAAATTTTT CAAAGATTAC GCTTTGAAAA CAAATGATAA AAGTCAATAC	2460
55	TTAGAAGACT ATAATCAACA CGTTGCCATT GTTGCTTTAT ACCTAGCAAA TGGTAATAAA	2520

	ACATTTTTAA	ACGCAGGCCG	TGCGCGTCGT	GGTGAGCTAG	TGTCATGTTT	CTTATTAGAA	2640
	GTGGATGACA	GCTTAAATTC	AATTAACTTT	ATTGATTCAA	CTGCAAAACA	ATTAAGTAAA	2700
5	ATTGGGGGCG	GCGTTGCAAT	TAACTTATCT	AAATTGCGTG	CACGTGGTGA	AGCAATTAAA	2760
	GGAATTAAAG	GCGTAGCGAA	AGGCGTTTTA	CCTATTGCTA	AGTCACTTGA	AGGTGGCTTT	2820
	AGCTATGCAG	ATCAACTTGG	TCAACGCCCT	GGTGCTGGTG	CTGTGTACTT	AAATATCTTC	2880
10	CATTATGATG	TAGAAGAATT	TTTAGATACT	AAAAAAGTAA	ATGCGGATGA	AGATTTACGT	2940
	TTATCTACAA	TATCAACTGG	TTAATTGTTT	CCATCTAAAT	TCTTCGATTT	AGCTAAAGAA	3000
	GGTAAGGACT	TTTATATGTT	TGCACCTCAT	ACAGTTAAAG	AAGAATATGG	TGTGACATTA	3060
15	GACGATATCG	ATTTAGAAAA	ATATTATGAT	GACATGGTTG	CAAACCCAAA	TGTTGAGAAA	3120
	AAGAAAAAGA	ATGCGCGTGA	AATGTTGAAT	TTAATTGCGC	AAACACAATT	ACAATCAGGT	3180
20	TATCCATATT	TAATGTTTAA	AGATAATGCT	AACAGAGTGC	ATCCGAATTC	AAACATTGGA	3240
	CAAATTAAAA	TGAGTAACTT	ATGTACGGAA	ATTTTCCAAC	TACAAGAAAC	TTCAATTATT	3300
	AATGACTATG	GTATTGAAGA	CGAAATTAAA	CGTGATATTT	CTTGTAACCT	GGGCTCATT	3360
25	AATATTGTTA	ATGTAATGGA	AAGCGGAAAA	TTCAGAGATT	CAGTTCACCTC	TGGTATGGAC	3420
	GCATTAACCTG	TTGTGAGTGA	TGTAGCAAAT	ATTCAAAATG	CACCAGGAGT	TAGAAAAGCT	3480
	AACAGTGAAT	TACATTCAGT	TGGTCTTGGT	GTGATGAATT	TACACGGTTA	CCTAGCAAAA	3540
30	AATAAAATTG	GTTATGAGTC	AGAAGAAGCA	AAAGATTTTG	CAAATATCTT	CTTTATGATG	3600
	ATGAATTTCT	ACTCAATCGA	ACGTTCAATG	GAAATCGCTA	AAGAGCGTGG	TATCAAATAT	3660
	CAAGACTTTG	AAAAGTCTGA	TTATGCTAAT	GGCAAATATT	TCGAGTTCTA	TACAACTCAA	3720
35	GAATTTGAAC	CTCAATTCGA	AAAAGTACGT	GAATTATTCG	ATGGTATGGC	TATTCCTACT	3780
	TCTGAGGATT	GGAAGAAACT	ACAACAAGAT	GTTGAACAAT	ATGGTTTATA	TCATGCATAT	3840
40	AGATTAGCAA	TTGCTCCAAC	ACAAAGTATT	TCTTATGTTT	AAAATGCAAC	AAGTTCGTGA	3900
	ATGCCAATCG	TTGACCAAAT	TGAACGTCGT	ACTTATGGTA	ATGCGGAAAC	ATTTTACCCT	3960
	ATGCCATTCT	TATCACCACA	AACAATGTGG	TACTACAAAT	CAGCATTCAA	TACTGATCAG	4020
45	ATGAAATTAA	TCGATTTAAT	TGCGACAATT	CAAACGCATA	TTGACCAAGG	TATCTCAACG	4080
	ATCCTTTATG	TTAATTCTGA	AATTTCTACA	CGTGAGTTAG	CAAGATTATA	TGTATATGCG	4140
	CACTATAAAG	GATTAAAATC	ACTTTACTAT	ACTAGAAATA	AATTATTAAG	TGTAGAAGAA	4200
50	TGTACAAGTT	GTTCTATCTA	ACAATTAAAT	GTTGAAAATG	ACAAACAGCT	AATCATCTGG	4260
	TCTGAATTAG	CAGATGATTA	GACTGCTATG	TCTGTATTTG	TCAATTATTG	AGTAACATTA	4320
55							

	ATGTTTTGGA GACAAAATAT ATCTCAAATG TGGGTTGAAA CAGAATTTAA AGTATCAAAA	4440
	GACATTGCAA GTTGAAGAC TTTATCTGAA GCTGAACAAG ACACATTTAA AAAAGCATTA	4500
5	GCTGGTTTAA CAGGCTTAGA TACACATCAA GCAGATGATG GCATGCCTTT AGTTATGCTA	4560
	CATACGACTG ACTTAAGGAA AAAAGCAGTT TATTCATTTA TGGCGATGAT GGAGCAAATA	4620
10	CACGCGAAAA GCTATTCACA TATTTTCACA ACACTATTAC CATCTAGTGA AaCAAACCTAC	4680
	CTATTAGATG AATGGGTTTT AGAGGAACCC CATTTAAAT ATAAATCTGA TAAATTTGTT	4740
	GCTAATTATC ACAAACCTTG GGTAAAGAA GCTTCGATAT ACGACCAATA TATGGCCAGA	4800
15	GTTACGAGTG TATTTTTAGA AACATTCTTA TTCTTCTCAG GTTTCTATTA TCCACTATAT	4860
	CTTGCTGGTC AAGGGAAAAT GACGACATCA GGTGAAATCA TTCGTAAAAT TCTTTTAGAT	4920
	GAATCTATTC ATGGTGTATT TACCGGTTTA GATGCACAGC ATTTACGAAA TGAACCTATCT	4980
20	GAAAGTGAGA AACAAAAAGC AGATCAAGAA ATGTATAAAT TGCTAAATGA CTTGTATTTA	5040
	AATGAAGAGT CATACACAAA AATGTTATAC GATGATCTTG GAATCACTGA AGATGTGCTA	5100
	AACATGTGTA AATATAATGG AAACAAAGCA CTTTCAAACCT TAGGCTTTGa ACCTTATTTT	5160
25	GAGGAACGTG AATTTAACCC AATCATTGAG AATGCCTTAG ATACAACAAC TAAAAACCAT	5220
	GACTTCTTCT CAGTAAAAGG TGATGGTTAT GTATTAGCAT TAAACGTAGA AGCATTACAA	5280
	GATGATGACT TTGTATTTGA CAACAAATAA CAATTAAATT AAAAGACCTT CACATGTAAA	5340
30	GGGAAATAGC GATTGTTTTT GTCTTGTCTC CTACATGTTG AAGGTCTTTT TTTATGTGTA	5400
	TCTAACTCAT TATGAGTCTG AGTAAGAAAT CAATGCTCTA AGATGTACAA TGCTATTTAT	5460
35	ATTGGCAGTA GTTGGCGGGG CCCCAACACA GAAGCAGGCG GAAAGTCAGC TAACAATATT	5520
	GTGCAAGTTG GCGGGGCCCC AACATAGAAG CAGGCGGAAA GTCAGCTAAC AATAATGTGC	5580
	AAGTGGCGG GGGCCCAACA TAAAGCAGG CGGAAAGTCA GCTAACAATA TTGTGCAAGT	5640
40	TCGGGCGGGG CCCCAACATA AAGAAAAACT TTTTCCTTTA GAAATTATCA CTTCCaCaTG	5700
	AGTTTTACTC ATGTATTCCT ATTTTAAAGT ACACATTAGC TGAGGCTAAT GTTAAGAACC	5760
	ACTACTTAAT CAATCATTAG TAGTTTTTAT CATTTCCACT ATTCCCAGAC ATCaAAATCT	5820
45	TAAGTGTCTT ATTTTACTTT AAGTAAACAA AATACACATT CCGAAAAATT AAATTTAGT	5880
	TTAATTGCAA ATATCAATAA AATTGACACT AAATTATTTG AAAGGCTATT GAAATTATGG	5940
	TCAAAAAACG CTACTATTAA TGAGAAATAT TATCAATGAT AATGATTATC ATTAATTTAA	6000
50	AGGGAGAAAA ATTTGTAATG AAGTATTTAT TAAAGGAAA TATTTTGCTT CTATTACTAA	6060
	TATTGTTGAC AATTATTTTCG TTGTTTCATAG GTGTGAGTGA ACTATCAATT AAAGATTTAC	6120

55

5
 10
 15
 20
 25
 30
 35
 40
 45

GTATTTTAAT TGCTGGAAGT TCGTTGGCTT TAGCAGGCTT GATAATGCAA CAAATGATGC	6240
AAAATAAGTT TGTAGTCCG ACTACAGCTG GAACGATGGA ATGGGCTAAA CTAGGTATTT	6300
TAATTGCTTT ATTGTTCTTT CCAACCGGTC ATATTTTATT AAAACTAGTA TTTGCTGTTA	6360
TTTGCACTAT TTGCGGTACG TTTTATTG TTAATCAT TGATTTTATA AAAGTGAAAG	6420
ATGTCATTTT TGTACCGCTT TTAGGAATTA TGATGGGTGG GATTGTTGCA AGTTCACAAC	6480
CTTCATCTCA TTGCGCACGA ATGCTGTTCA AAGCATTGGT AACTGGCTTA ACGGGAACCT	6540
TGCCATTATC ACAAGTGGAC GCTATGAAAT TTTATATTTA AGTATTCCTC TTTTAGCATT	6600
GACATATCTT TTTGCTAATC ATTTACGAT TGTAGGAATG GGTAAAGACT TTAATAATA	6660
TTTAGGTTTG AGTIACGAAA AATTAATTAA CATCGCATTG TTTATTACTG CAACTATTAC	6720
AGCATTGGTA GTGGTGAAGT TTGGAACATT ACCGTTCTTA GGACTAGTAA TACCAATAT	6780
TATTTCAATT TATCGAGGTG ATCATTTGAA AAATGCTATC CCTCATACGA TGATGTTAGG	6840
TGCCATCTTT GTATTATTTT CTGATATAGT TGGCAGAATT GTTGTATTATC CATATGAAAT	6900
AAATATTGGT TTAACAATAG GTGTATTTGG AACAATCATT TTCCTTATCT TGCTTATGAA	6960
AGGTAGGAAA AATTATGCGC AACAATAATA AAAAAATAAT GCTTTTAATT GCAGTAACGT	7020
TATTAATTAG TATGCTGTAC TTATTTGTAG GTATTGATT TGAATATTT GAATATCAAT	7080
TTTCAAGTCG TTAAGAAAG TTCATATTAA TTATTTTAGT AGGTGCTGCC ATTGCAACTT	7140
CAGTGGTGAT TTTCAAGCG ATTACAAATA ACCGTCTATT GACACCATCA ATAATGGGGT	7200
TAGATGCAGT TTATTTATTT ATCAAAGTAT TGCCAGTCTT TTTATTTGGA ATTCAATCGG	7260
TATGGGTAC TAATGTATAT TTGAACTTTA TATTAACACT TATAACGATG GTGTTATTCG	7320
CACTAATCCT ATTCCAAGGT ATCTTTAAAA TCGGACATT TTCAATTTAT TTTATCTTAC	7380
TTATGTTGT CTTTTAGGA ACATTTTTTA GAAGCATAAC AGGTTTATT CAACTGATTA	7440
TGGATCCTGA GTCATTTTGA GCAATACAAA GTAGTATGTT TGCTAATTTT AATGCTTCTA	7500
ATTCGAATTT AGTACTTTC TCAGCAGTGC TATTAGTAAT CTTATTAGTC ATTACAATTT	7560
TACTATTGCC TTATTTAGAT GTATTGCTTT TAGGTCGTGC TGAAGCAATT AATCTGGGA	7620
TATCGTATGA AAAATTAACG CGAATT	7646

(2) INFORMATION FOR SEQ ID NO: 122:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1194 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 122:

5 ATGAATATAT TTnnAAATAA ATTATTATGG ATTGCACCAA TnGCCACTAT GATTATCTTG 60
 GTAATCTTTT CTTTAGCTTT TTATCCTGCA TATAATCCTA AACCAAAAGA TTTACCAATT 120
 GGTATATTAA ACGAGGATAA AGGTACAACG ATTCAAGATA AAAATGTTAA CATTGGTAAA 180
 AAATTAGAGG ATAAATTATT AGATAGTGAT TCTAATAAAA TTAAATGGGT TAAGGTTGAT 240
 10 AGTGAAAAAG ACCTTGAAAA AGATTTGAAA GATCAAAAAA TCTTTGGAGT AGCTATTATT 300
 GATAAAGACT TTTCAAAAGA TGCTATGAGT AAAACACAAA AAGTAGTTAT GGATAGTAAA 360
 AAAGAAGAAA TGCAACAAAA AGTTGCTTCA GGTGAAATTC CGCCACAAGT GGTTCACAAA 420
 ATGAAACAAA AAATGGGGAA TCAACAAGTA GAGGTTAAGC AGGCTAAATT TAAAACGATT 480
 GTAAGTGAAG GATCAAGCTT ACAAGGTTCA CAAATTGCAT CAGCTGTGTT AACTGGTATG 540
 20 GGTGATAATA TTAATGCTCA AATTACGAAG CAAAGTTTGG AAACATTAAC GAGTCAAAAT 600
 GTTAAAGTCA ATGCCGCGGA CATCAATGGT TTGACGAATC CAGTAAAAGT GGATAATGAA 660
 AAACCTAATA AAGTTAAAGA TCACCAAGCA GGTGGTAATG CACCATTCTT AATGTTTATG 720
 25 CCAATTTGGA TAGGTTCAAT CGTAACGTCT ATCTTATTGT TCTTTGCATT TAGAACTAGT 780
 AACAATATCG TCGTGCAACA TCGTATCaTT GctTCAATTG GACAGATGAT ATTTGCAGTT 840
 GTTGCAGCAT TTGCAGGTAG CTTTGTTTTAT ATTTATTTCa TGCAAGGCGT TCAAAGATTT 900
 30 GATTTTGACC ATCCAAATCG TATCGCAATT TTTGTAGCAT TTGCGATTCT TGGTTTCGTG 960
 GGCTTATTT TAGGTGTTAT GGTATGGCTA GGTATGAAGT CAGTTCCAAT TTTCTTCATT 1020
 TTAATGTTCT TTAGTATGCA ACTTGTAACG TTACCTAAAC AAATGTTGCC TGAAAGTTAT 1080
 35 CAAAAATATG TATATGATTG GAATCCATTc ACACACTATG CAACAAGTGT AAGAGAcTAT 1140
 TATACTTGAA TCATCATATT GAATTAAATA GTACAATGTG GATGTTTATA GGGT 1194

(2) INFORMATION FOR SEQ ID NO: 123:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 558 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 45 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 123:

50 GACCGACCTA TACATCCGTA TAAGTATTTTc TTGATATAAG TCTTCTAAAT CATAATGATT 60
 AAATCCAAAT GTTTTGATGC GTCGAATAAT TAATGGTTGT AGATCCATTA CTAACTTTTC 120

55

	GTATTTCAAA TATTAAACTA ACCCCTTCTA TCTAAAATTT AAGGTTAGTT TAATATTGTT	240
	ACATTCAAAA TTTCAAGATG ACGGAAATGT CATTCTTAT GATGTCCTCT TCGTATTTTT	300
5	TCAAATTCTG CAAGGATTTT AGAAGATAAC GGAATTCGAG TTCTTGGCTT GTTTTCACTT	360
	ATATCATCTA ATGATTTACT CACATCAAIT TCATTTTCTT TTAAATCTCT CCACATTTCTG	420
	CGAGATGATA TTCTATATGC ACCTGATCCA AAGATAGCAT GTTGcTCACT CaTATCACTT	480
10	GTTACAAC TG TAATATGcTT AGtATGCTTG tCaTAAAGtT CaTAAACCAT AACGTTTCTA	540
	ATGGAAACCA ATCAGCTG	558

(2) INFORMATION FOR SEQ ID NO: 124:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7762 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 124:

25	GCTTCAGACA TnTGATGATA TAATCTCTCA TCATCGATTA ATTCTTTTGC AGCTTGATA	60
	ACATnTTGCT TATTTGTTC AATGACTTTT AATGTGCCAG CTTCAACACC TTCAGGACGT	120
	TCTGTAACAC TTCGCCAAAA CTAAACTGG CTTATTAAAT GATGGCGCTT CTTCTGAAT	180
30	TCCACCTGAA TCTGTCAAAA TAAATAAGA TTTTnTAGCA AAATTATGGA AATCTATACG	240
	TCCAAAGGTT CAATCAATTC AATTCTGTCA TGA CTACCTA AAATCTTTTG AGCCACCTCT	300
	CGAACTTTCTG GGTTTTTATG CATTGGATAT ACCAGTGCTA AATCAGTATA CTCATCTATT	360
35	AAGCGTCTAA CCGCTTTAAA TATATTTTCC aTGGGTTTCC CGATATTTTC TCGTCGGTGT	420
	GCTGTCATrA GAATGAATTT kTtGTCATGG TATTTATCCA TGATGTTAGA TTTATAATTG	480
	TCATCAACTG TATATTTTCAT AGCATCAATC GCAGTATTAC CAGTGACAAC AACACTTTCT	540
40	GAATATTTCC CTTCACTTAA CAAATGCGAT GCAGCATTTT TAGTAGGTGC AAAATGTAAG	600
	TCAGCTAATA CACCAACTAA TTGTCTATTC ACCTCTTCTG GAAAAGGTGA ATATTTATCA	660
45	TAACTTCTAA GCCCTGCTTC AACGTGTCCA ATCGGCACTT GGTATAAAA TGCCGCTAAA	720
	CCACCTGCAA ATGTCGTCAT CGTATCACCA TGTACAAGTA CCATGTCTGG TTTTCTAAT	780
	TGAATCACTT GTTCTAATTG AGTGATTGAT TTAGAAGTTA TCTCAGAAAG TGTCTGCTCT	840
50	GATTTTCATAA TATTCAAATC GTATTTTGGT TTGATTTCAA AGGTA CTTAA TACTGAATCA	900
	AGCATTTCTC TATGCTGTGC TGTAACAACA ACAATTGGCT CGAGCATTTT TTCTTGTTCC	960

EP 0 786 519 A2

	ATCTTTTTCA	TCAA	ACTACT	TATCTCCGAT	TCTTCTATTT	AGTACCAAAC	AATCTATCTC	1080
	CAGCGTCGCC	TAAC	CCTGGT	GTGATATATG	CTTTGTCAAT	aGCTTTTCAT	CAAGTGCAGC	1140
5	AATATAAATA	TCTACATCTG	GATGTGCTTC	ATGCATCTTT	TCTACGCCTT	CTGGTGCTGC	1200	
	AATTAAACAC	ATGAAGCGAA	TATTTTTAGC	GCCACGTTTC	TTCAATGAAG	TAATAGCTTC	1260	
	AATTGCTGAT	GCGCCTGTTG	CTAACATAGG	ATCAACAACA	ATGATTGTGC	TTTCAGTAAT	1320	
10	ATCTTGAGGT	AACTTAGCAA	AATACTCTAC	AGCCTTTAAT	GTTCGGGAT	CTCGATATAA	1380	
	ACCGATATGT	CCAACTCTGG	CTGCAGGTAC	TAAACTTAAA	ATACCATCAG	TCATACCTAA	1440	
	ACCAGCTCTT	AAAATTGGAA	CGATAGCTAA	TTTTTTACCA	GCTAATCGTT	TAGCCGTCAT	1500	
15	TTTAGTTACA	GCGGTTTCAA	TATCAACATC	CTGAAGCTCT	AAGTCTCTAG	TTACTTCATA	1560	
	TGCCATCAAC	ATACCAACTT	CGTCTACAAG	TTCTCTAAAT	TCTTTAGTAC	CTGTATTTAC	1620	
20	ATCTCTAATA	TAGCTTAGTT	TGTGTTGAAT	TAATGGATGA	TCGAAAACGT	GTACTTTACT	1680	
	CATAAAAATT	ACTCCTATCT	TTGTGTATGT	TTATTGATAT	AGAGGATATT	CAGCTGTTAA	1740	
	TTTCGCAACG	CGTTCCTTAG	CTTGTGTGTA	TTTTTCTTCA	TCTTTACTAT	TTTTCAATGC	1800	
25	TAAACTGATG	ATTTTTGCAA	CTTCCTCAAA	AGCTTTTTTCA	TCAAATCCAC	GCGTTGTTGC	1860	
	AGCAGGTGTA	CCTAAACGTA	TACCACTCGT	TACAAAAGGT	TTTTCTTGAT	CGAACGGAAT	1920	
	GGTATTTTTG	TTACATGTGA	TACCAACTGA	ATCTAAAGTC	TCTTCAGCTT	CTTTACCAGT	1980	
30	AAGTCCTATA	GACCCTTTTA	CATCAACAGC	TACTAAGTGA	TTATCTGTAC	CGCCAGAAAC	2040	
	AATTCTAAAT	CCTTCATTAA	TTAATGCTTC	TGCAAGAACT	TTTGCGTTTT	TAACCACTTG	2100	
	TTGTTGATAC	GTTTTGAAAT	TATTTTCTAA	CGCTTCTCCA	AAAGCAACTG	CTTTtGCTgC	2160	
35	AATAACATGC	TCAAGAGGTC	CACCTTGAAT	ACCAGGGAAA	ATTGTTTTAT	CTATGTCTTT	2220	
	TTTATATTCT	TCCTTACATA	AAATCATACC	ACCACGtGGT	CCGcGTAATG	TTTTGTGTGT	2280	
	TGTAGTTGTT	ACAAAATCAG	CATATTCTAC	TGGATTGGA	TGTAAACCTG	CCGCTACTAA	2340	
40	TCCTGCAATA	TGTGCCATGT	CTACCATTAA	CTTAGCGTTT	ACTTCATCTG	CGATTTCTTT	2400	
	AAACTTTTTG	AAGTCAATTG	TTCTTGAATA	TGCTGATGCT	CCTGCCACAA	TAAGCTTAGG	2460	
45	CTTATGCTCT	AACGCTAATT	TACGAACCTC	ATCATAATTG	ATTCGTTCTG	TGTCTTTATC	2520	
	TACTCCATAT	TCAACGAAAT	TGTAGAATTT	ACCACTAAAA	TTAACAGGCG	CTCCATGTGT	2580	
	CAAGTGACCA	CCATGACTCA	AATTCATACC	TAAAACGTG	TCGCCCATTT	CTAATGCAAC	2640	
50	TAAGTAAACA	GCCATGTTG	CTTGTTGAACC	TGAATGTGGT	TGAACATTGA	CATGTTTCAGC	2700	
	TCCAAACAAT	GCTTTAGCAC	GATCAATTGC	GATGCTTTCA	GTAACATCTA	CAAACCTACA	2760	

55

EP 0 786 519 A2

	TTGTGCTTCC ATAACCGCTT CCGATACAAA ATTTTCCGAT GCGATTAACT CTATGTTGCT	2880
	ATTTTGTCTC TGAAATTCTC TCTCGATTGC TTCTGCGATA ACTTTATCTT GCTTGGTGAT	2940
5	ATAAGACATA AAATCTCCCC TTCTTTCAAA AAAACTTATT GGTATTTAGC ACGTTCGCCA	3000
	CCAATCTTTT TCGGCCTAGA TGTGGCAATA GTTACAATTG CCTGTCCTAC TTGCTTTACT	3060
	GAGGTCCTTA CAGGTACACA TACATGTTTA ATATGCATGC CTATTAACGT TTGACCAATA	3120
10	TCAATTCCAC AAGGAACAGT AATATGTTTC ACCACGATCG GATCCTTCAT ATGCTGAAAA	3180
	GCGTATGTTG CCAAACCTCC TCCAGCATGT ACATCTGGAA CGACGGAAAC TTCTTCCATT	3240
	GTTAATGGAT TATACTGAGA TTTTCTATT GTTATCGCTC TGTGATATG TTCACATCCT	3300
15	TGAAAGCAA AAGTAACGCC TGTCTCTTTA CTCACAACAT CTAATGCATT AAAAATAGTT	3360
	TCTGCAACTT CCaTCGAACC GACAGTCCCT ATTTTTCGCG CAATGACTTC CGATGTTGAA	3420
20	CATCCAATTA AACATATATC TCCTTTATTA AAAAAGGACA TATCTTTTAA TTCGTCTAAT	3480
	AACATTGTCA AATCTTTCAT AAAAGCCAC CCTTCCTAAA AATAAAAAAG GAATATAGCA	3540
	AAGTGCTACA CTCCTCTATT ATAACCTATT TAACTGTTAA CATATACTAA TTATACAGAA	3600
25	TTCCTACTAG CAAATAATAT CTTTAAATTT TAAATTTAAA CTTACAAGTT CTTCATAGGT	3660
	ATGTACATAC ATTTCTTTTG TTCCACCGTA TGGATCTATA ACTTCTCCTG CTTCTTTTAC	3720
	ATATTGATGC AATGTGAAAA CATGATTTTG CAAACCAAAG TGTGCCTCTA TTAATTCTTT	3780
30	GTGCGAATAC GACATCGTCA AAATAATATC TGCTTTCAAA TCTGCTTCAG TAAATTGTTG	3840
	CGATAAGGTC GTTTCAGCTA AATGATGTTT TTCAACTAAG TCTTCAACAT AATTCGAAAC	3900
	ACCTTGATTG TTCACAGCGA ATATACCTCT TGATTCAAAT TGATGATTTG GCATAACCTC	3960
35	TTTTGCAATA CTTTCCGCTA ATGGGCTACG ACATGTGTTA CCTGTACAAA CGAATAAAAT	4020
	CTTGATAGTT CACATCCTTT AATAATGTGA TTACCTGCAG CTTTAAACAT GCGATTCTA	4080
40	ATTGCTTCTG TATTATCATT CAGCTCAAAG CCGTATATAT ACGCCGCTGA AATATTTTCA	4140
	TTTTCATCAA GTGAATGTAA CACATCATAA AGATTATGAC TTGCTTGTTT AACATCATTG	4200
	TCATCCTGAC ATAATTGAAT GAATTGCGCT TCACCTGGTA TAAACGCCAC CTTATTACTC	4260
45	GGCACAATAA AAGCTATAGA AGACCAATCT TTACCGTCAT TTCCAATTTT GCTCTCAATA	4320
	TCTGTAATAA TTGTAAGTGG TGTATTGGGT GAGTAATGCT TATACTTCAT ACCTGGTGCA	4380
	ATTGGCTGTT CAGTATCATT ATAATCAGCA TGGGCGATAC TATTCGGAAG TATTTCTGTA	4440
50	ATCATTGCTG CTGTTATAGA ACCAGGTCTT GCAATTTTAT AAGGAAAAGA TGTGCAATCT	4500
	AAAACCGTAC TTTCTAATCC TTCTTCACTT TGTTGAGCTT GAACAATACC ATCGATACGG	4560

55

EP 0 786 519 A2

	GCACTTGGAG CAGCTAGAGG TTCATTTATG ATTTGTAATA ATTGTCTACC TACAGAATGG	4680
	CTTGGCATT C TAACAGCAAC TGATGATAAA CCTCCAGAAA CTTTTCGACA TAGATAGCCT	4740
5	AGCTTTAACG GCAATATAAA CGAAATAGGG CCCGGCCAGA ATGCCTGCAT TAACTTTTCT	4800
	ACGCGTGGAT CCAAAGTATA TGTAAAATCT TTTAATTGAC CTTTACTGTG TATATGAACA	4860
	ATAAGCGGAT TGTGAGATGG ACGGCCTTTA GCTTCATATA TTTTAGCTAC AGCTTCTTCA	4920
10	TCTGTCGCAT TTGCTGCAAG TCCATAAACT GTTTCAGTTG GTAAACCTAT TAAACCACCG	4980
	TTTAAAACAA TGTCTTTTAT TTCATTAATT TTAGGATATT GCTGTAAATC TTCATTATAT	5040
	TCTCTAACAT CCCAAATTTT AGTATCCAAC TTAATCACGC CTTTCTTATT TATCATAATA	5100
15	TAAAGCAAAA AGCTATGCAC TTAAC TAATC ATAGCAAAG CATAACTTCT AATTACCATT	5160
	TAAATGAGAC GATTTCGATCG TGGCCATTTA TATCTTTAAT AATGTCGATT TTTTGTGAG	5220
	GAAATTTATT TAAATTATT GATTTAAGTG CCTCACCTTG ATTGTAACCA ATTTCAAAAA	5280
20	CAACTGGGCT GCCTTTTTCC ATAACGTGAG GTAAATCTTC AATGATTGAT TCATAAATAG	5340
	CATATCCATG GTTATCTGCA AACAATGCCT GATGTGGTTC GAATCTCGTA ACCGTTGGAG	5400
25	ACATCGTAAC CATATCTTTT TCATCTATAT ATGGTGGATT AGATATCAAG CCGTTCAACT	5460
	TGATACCTTC ATTAATTAAG GGCTTTAATG CATCCCTGT TAAAAATTGT ATTTGTGATT	5520
	GATGCTTCTC AGCATTATTA CGAGCCATAT TCATTGCTTC AAGTGAAATA TCAGTAGCAA	5580
30	TAACATTTAA ATCCGGCTTT TCACATTTCA AAGTAATTGC AAGTACACCA CTACCCGTTT	5640
	CGATATCTAC GATTGTTGCA TCATCTTCTA ACTGTTGTAA GAAATGCAAC ATTACTTCTT	5700
	CAGTTTCAGG TCTTGGTATC AAACAATTTG AGTTTACATC AAACGTTCTA CCATAAAATG	5760
35	AGGCAAAGCC AACTATATAC TGTATAGGCT CTCCTAATAA CATACGTTGT AATGCTAAGT	5820
	CGA A CTTCAT AATCATCGCT TTCGGCATAT CATCATGCAT GTGGACTACA AAGTCCGTAC	5880
	GCGTCCATTG AAATACATCT AACATTAACC ATTCAGCTCG TGTGTTTCA AACCCTTTTT	5940
40	GTTGTGTTAA ATGAATTGCT TCATCTAACT TTTCTTTATA ATTCACCATT ATTAAGTTCT	6000
	TTCAATTTAT CTGTCTGCTC TGATAAAGTC AGTGCACTA TAATTTCTTC TAAATGGCCT	6060
	TCCATAATTT GCCCTAATTT TTGAAGCGTT AGACCTATAC GATGGTCTGT TACACGGCTT	6120
45	TGTGGATAAT TATAAGTTCT AATACGTTCT GAACGATCAC CAGTACCGAC TGCTGATTTA	6180
	CGTGTGACG CATACTTTTG TTGTTCTTCT TGAAC TTTC TATCGTATAA ACGTGCTTTT	6240
50	AACACTTTCA TTGCTTTTTT ACGGTTTTGA ATTTGAGACT TCTCAGAAGA TGTTGCAATG	6300
	ACACCAGTTG GTAAATGGGT AATACGTACT GCAGAGTCAG TTGTGTTTAC GTGCTGACCA	6360

55

EP 0 786 519 A2

	ACATCTTCAA CTTCTGGTAA AACTGCCACT GTAGCTGTTG AAGTATGAAT ACGTCCACCT	6480
	GATTCTGTTT CAGGCACACG TTGAACGCGG TCGCACCACAT TTTCAAATTT CAATTTACTA	6540
5	TACGCGCCAT TACCAGAAAC TGAGAAACTA ATTTCTTTGT AACCACCATG GTCACCTTCA	6600
	GACGCTTCTA CTATTTAGT TTTGAATCCT TGTGATTGAG CATACTTTGA ATACATACGC	6660
	ATTAAATCAC CAGCAAAAAT CGCAGCCTCA TCACCACCTG CTGCTGCTCT TATTTCTACA	6720
10	ATAACGTCTT TGTGATCATT AGGATCTTTA GGAATCAATA ATATTTTAAG CTCTTCTTCA	6780
	AGATTTGGAA GTTCAGCTTT AATACCATTA CTCTCCTCTT TTAACATTTT TACTTCTTCT	6840
15	TTATCATCAG TCTCACTTAA CATTTCTTCA ATATCAGCTA ATTCTTCTTT TTTAGCTTTA	6900
	TAGTTACGAT AAACATCTAC AGTTTTTTGT AAATCAGCTT GCTCTTTAGA ATATTTACGT	6960
	AATTTATCTG AATCATTTAC AACATCTGGG TCACTTAACA GTTCATTTAA CTGTTCTGAT	7020
20	CTTTCTTCTA CAATATCTAA TTGATCAAAC ACTTATAATT CCTCCTTATT ATTATCACTA	7080
	GGTGCTACGA TATGGTGCGC GCGACAACGT GGCTCATAAC TTTCAATTGGC ACCTACTAAG	7140
	ATAATCGGAT CATCGATTTT AGCTGGTTTA CCATTTATTA ATCGTTGCGT TCTACTAGAT	7200
25	GAAGAACCAC AAACAGCACA AACTGCTTGA AGTTTCGTTA CTTGTTCACT GACAGCCATC	7260
	AATTTAGGCA TTGGTTGCGA CGGTTGCGCC CTAAATCCA TATCTAATCC AGCAACAATA	7320
	ACACGGTGTC CATCTGCTGA TAGTTTTTCT ACTATACTTA CAATTTCACT GTCAAAAAAT	7380
30	TGCACTTCGT CTATTCCTAT AACATCAACA TTAGTTAAGT CGTGCGTCAT AATTTCACTT	7440
	GCTTTAGAAA TATTAATCGC TTCAATGGCA TTACCATTAT GAGAGACCAC TTTTCTTTA	7500
	TGATATCGAT CATCAATCGC CGGTTTAAAT ACAACGACTT TTTGTTTAGC GTATATACCC	7560
35	CTTCTTAGAC GTCTTATTAG TTCTTCGGAT TTACCGCTAA ACATACTACC TGTAAATACAT	7620
	TCTATCCAAC CGGAATGGTA AGTTTCATAC ATTGAGAGT CCACCTTTTT CAAAACATAA	7680
40	TCGCTTTATT ATATCATATT TCAAATATTC ATAAATGTCT TTnTCATAAT TATATCGATA	7740
	TTGTACATGA ACAATTATTT TA	7762

(2) INFORMATION FOR SEQ ID NO: 125:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 2583 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 125:

EP 0 786 519 A2

TAAAAAAATT ATTATCAATG ATGAACTAGA ATTGACTGAA TTCCACCAAG AACTTACTTA 120
 TATTTTAGAC AACATAAAG GGAATAATAA TTATGGTAAG GAATTTGTTG CAACCGTTGA 180
 5 AGAAACATTC GACATTGAAT AaAGCGGGT GgaAGCACTA TGAATCAATG GGATCAGTTC 240
 TTAACACCTT ATAAGCAAGC GGTGATGAG TTGAAAGkGA AcTTaAAGGC ATGCGCAAAC 300
 AATATGAAGT TGGTGAACAA GCGTCGCCAA TAGAATTTGT TACTGGTCGT GTTAAACCAA 360
 10 TCGCTAGTAT TATAGATAAG GCAAACAAAC GACAAATACC ATTTGATAGG TTAAGAGAAG 420
 AAATGTACGA TATCGCTGGT TTAAGAATGA TGTGCCAATT TGTTGAAGAT ATTGATGTTG 480
 TCGTCAATAT TTTAAGACAA AGAmAAGATT TTAAAGTAAT TGAAGAACGA GATTATATTC 540
 15 GTAACTACTAA AGAAAGTGGT TACCGCTCGT ATCATGTCAT TATTGAATAT CCAATTGAAA 600
 CATTACAAGG CCAAAAATTT ATATTGGCTG AGATTCAGAT TCGTACATTA GCAATGAATT 660
 TCTGGGCAAC GATTGAACAT ACTTTACGAT ATAAATATGA TGGTGCTTAT CCGGATGAAA 720
 20 TTCAACATCG TTTGGAAAGA GCGGCAGAAG CAGCGTATTT ACTTGATGAA GAGATGTCTG 780
 AAATTAAAGA TGAAATTCAG GAAGCTCAAA AATATTACAC GCAAAAACGT TCTAAAAAAC 840
 25 ATGAAAATGA TTAACGAGGT GTTATAAATC ATGCGTTATA CAATTTTAAC TAAAGGTGAC 900
 TCCAAGTCTA ATGCCTTAAA GCATAAAATG ATGAACTATA TGAAAGrTTT TcGCATGaTT 960
 GaGGATrGTG AAAaTCCTGA AATTGTTATT yCAGTTGGTG GTGACGGTAC ATTACTACAA 1020
 30 GCATTCCATC AGTATAGCCA CATGTTATCA AAAGTGGCAT TTGTTGGAGT TCATACAGGT 1080
 CATTTAGGAT TTTATGCGGA TTGGTTACCT CATGAAGTTG AAAAATTAAT CATCGAAATT 1140
 AATAATTCAG AGTTTCAGGT CATTGAATAT CCATTGCTTG AAATTATTAT GAGATACAAC 1200
 35 GACAACGGCT ATGAAACAAG GTATTTAGCA TTAAATGAAG CAACGATGAA AACTGAAAAT 1260
 GGCTCAACAC TTGTTGTGGA TGTTAACTTA AGAGGGAAAC ACTTTGAGCG ATTTAGAGGC 1320
 GATGGATTAT GTGTATCAAC ACCTTCGGGT TCAACGGCTT ATAACAAAGC GCTAGGTGGC 1380
 40 GCACTGATAC ATCCTTCACT TGAAGCAATG CAAATTACAG AAATGCCTC GATAAATAAT 1440
 CGTGTGTTTA GAACGGTAGG ATCACCACCT GTATTACCAA AGCATCATAC ATGTTTAATA 1500
 TCACCAGTTA ATCATGATAC CATTAGAATG ACGATAGATC ATGTTAGTAT CAAACATAAA 1560
 45 AATGTTAATT CAATACAATA CCGTGTAGCA AATGAAAAAG TGAGGTTTGC ACGTTTTAGA 1620
 CCATTCCCAT TCTGGAAACG TGTGCACGAT TCTTTCATAT CAAGTGATGA AGAACGATGA 1680
 50 AATTAAAGTA TCATATATCA CAACAAGAAA CTGTTAAAAC TTTTITAGCA CGACATGATT 1740
 TTTCTAAGAA GACAGTGAGC GCCATTAAAA ATAATGGCGC TTTAATTGTT AATGATGAAC 1800

55

EP 0 786 519 A2

	AAATACCGAG TGTTAATTTA ATACCTTATG CTCGTAAGCT AGAAGTATTG TATGAAGATG	1920
	CTTTTATCAT CATAGTTACT AAACCAAACA ATCAAAATTG TACGCCTTCG AGAGAACATC	1980
5	CTCATGAAAG TTTAATCGAA CAAGTACTAT ATCATTGTCA GGAACATGGT GAAAATATTA	2040
	ACCCACATAT TGTTACGCGT CTAGATCGTA ATACAACTGG TATTGTGATA TTCGCTAAAT	2100
	ATGGACATAT CCATCATTTA TTTTCTAAAG TAAACTTGAA AAAAATATAT ACTTGCCTTG	2160
10	TATATGGTAA AACCCATACA TCTGGTATTA TTGAAGCTAA TATTAGACGG TCAAAGGATA	2220
	GGATTATAAC TAGAGAAGTT GCCTCGGATG GTAAATACGC TAAAACATCT TATGAAGTAA	2280
	TAAATCAGAA TGATAAATAC AGTTTATGCA AAGTTCATTT GCATACGGGA CGTACACATC	2340
15	AAATTCGTGT ACATTTTCAA CATATTGGGC ATCCAATTGT GGGAGATTCT TTGTATGATG	2400
	GTTTTCATGA CAAAATTCAT GGTCAAGTAC TGCAATGTAC GCAAATATAT TTTGTTTCATC	2460
20	CAATCAATAA GAACAATATT TATATTACAA TTGATTATAA GCAATTACTT AAATTATnCA	2520
	ATCAACTCTA ATnCACACAG GGGGTGTAAG TATGTCAATG AnCACAGATG AAAAAGAGCG	2580
	TGT	2583

25 (2) INFORMATION FOR SEQ ID NO: 126:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 1818 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 30 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 126:

35	ATCAAGTGAT ACATTTAACT GGTAAAGGAT TAAnAGATGC TCAAGTTAAA AAATCnGGAT	60
	ATATACAATA TGAATTTGTT AAAGAGGATT TnACAGATTT ATTnGCAATT ACGGATACAG	120
	TAATAAGTAG AGCTGGATCA AATGCGATTT ATGAGTTCTT AACATTACGT ATACCAATGT	180
40	TATTAGTACC ATTAGGTTTA GATCAATCCC GAGGCGACCA AATTGACAAT GCAAATCATT	240
	TTGCTGATAA AGGATATGCT AAAGCGATTG ATGAAGAACA ATTAACAGCA CAAATTTTAT	300
45	TACAAGAACT AAATGAAATG GAACAGGAAA GAACTCGAAT TATCAATAAT ATGAAATCGT	360
	ATGAACAAAG TTATACGAAA GAAGCTTTAT TTGATAAGAT GATTAAAGAC GCATTGAATT	420
	AATGGGGGGT AATGCTTTAT GAGTCAATGG AAACGTATCT CTTTGCTCAT CGTTTTTACA	480
50	TTGGTTTTTG GAATTATCGC GTTTTTCCAC GAATCAAGAC TTGGGAAATG GATTGATAAT	540
	GAAGTTTATG AGTTTGTATA TTCATCAGAG AGCTTTATTA CGACATCTAT CATGCTTGGG	600

55

EP 0 786 519 A2

	CTCATGTTAA AGCGCCACAA AATTGAAGCA TTATTTTTTG CATTACAAT GGCATTATCT	720
	GGAATTTTGA ATCCAGCATT AAAAAATATA TTCGATAGAG AAAGACCTAC ATTGCTGCGT	780
5	TTAATTGATA TAACAGGATT TAGTTTTCT AGCGGTCATG CTATGGGATC AACTGCATAT	840
	TTTGGAAGTG GTATCTATCT ATTAAATCGA TTAAATCAAG GTAATTCAAA AGGTATTCTT	900
	ATAGGGTTAT GTGCAGCTAT GATTTTATTG ATTTCCATAT CACGTGTATA TCTAGGTGTA	960
10	CATTATCCAA CAGATATTAT TGCCGGCATT ATTGGTGGAT TATTTTGcAT TATTTTATCA	1020
	ACGTTATTAC TTAGAAATAA ATTAATAAAT TAAATAGTAA AAAAACAAAA GCAGTAAACC	1080
	TAAAGTGTCT TAAGGGTTTA CTGCTTTTAT AAAACGTTGT TATAACGTAT ATTGTCTTTT	1140
15	ACGGGCATAT AAnAGGGGAA TATTTGAnAA TGACCAATCC AACAAGAACG AAACGTTGTG	1200
	GGGGGGATGT TCTATGTGGT ATTGATAATC ATTTTCAACT ACTATTATAC ATTAGTGAGA	1260
20	ATCATTGTCA ATTAGAAACT AAAACTTTTT TTGAATATTT TTAAAGAATA GTAAATAAAA	1320
	CGCATGATTA CGCTATTTTA GAAAATAAAA AAATTTGTAT TTCTCATTAG AATTAGAATA	1380
	TTTAAAAGTG ATGAGGTTTA AACATTATAT TGTTACATA CTCCTTTTGA ATTCATACAT	1440
25	TATGAAATGT tACTTCCAAG TTCAAATCG CACATTGAAA TGATGTGTGA AATGTTTAAA	1500
	CTACGGTCAT tTTGTGmAAA TAAAGrTAAT AACTATTCAT TTTACAATAG TGAAAAGTCA	1560
	GTATATGACA ACAATTAATA TTGCGGTAAG GCCTTGTGTT ACAGTATTCT ATATTTAAGT	1620
30	ACTGCAATCA GAATTAACAG AATGCCATTA ACTGATTATT AAATATTTGA GTTAATAAAT	1680
	AATTAATGAT TGTAGCTTGA AAAATTTAAA ACATGGTTAT TGATTTGTGA TAAAATTAA	1740
	ACGTAAACAA ACTAATTTAA AAAGCAACTA TTGTATAGAA AAATACAAAA TTTAAATAT	1800
35	ATTACCTTAT TAGAAAAA	1818

(2) INFORMATION FOR SEQ ID NO: 127:

40	(i) SEQUENCE CHARACTERISTICS:
	(A) LENGTH: 12658 base pairs
	(B) TYPE: nucleic acid
	(C) STRANDEDNESS: double
	(D) TOPOLOGY: linear

45

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 127:

	TGTTTAAACA ATAGGGGGAA TCTTATGATT GAAAAATTAG TAACCTTTTT AAATGAGGTT	60
50	GTTTGGAGTA AGCCATTAGT TTATGGTTTG CTAATTACTG GTGTGCTATT TACATTGCGT	120
	ATgCGATTTT TTCAAGTTAG ACATTTTAAA GAAATGATTC GATTAATGTT TCAAGGAGAG	180

55

	GGTACAGGTA ATATTGTCGG TGTATCTACT GCAATATTTA TAGGAGGACC TGGTGCAGTA	300
	TTTTGGATGT GGATTACTGC GTTTTtagGT GCAAGTAGTG CTTTtATTGA ATCTACACTT	360
5	GGTCAAATAT TCAAGAGAGT TGAAAATAAT GAATACCGTG GTGGACCAGC GTATTATATT	420
	GAATATGGTA TTGGTGGTAA ATTTGGTAAA ATTTACGGAA TTATCTTTGC TATTGTTACG	480
10	ATTATCTCAG TAGGTCTATT GCTTCCTGGT GTGCAATCTA ACGCTATAGC AAGTTCTATG	540
	CATAATGCGA TTCATGTTCC ACAATGGTTA ATGGGTGGTA TTGTTGTAGT TATTTTGGGA	600
	TTAATTATTT TTGGTGGTGT ACGTATTATT GCCAATGTTG CAACAGCCGT TGTACCATT	660
15	ATGGCAATTA TTTACATACT GATGGCTGTC ATTATCATTT GTATCAATAT ACAAGAAGTG	720
	CCAGCGTTAT TTGCATTAAT TTTCAAATCA GCATTGCGAT TACAATCTGC TTTTGGTGGT	780
	ATCGTTGGCG CAATGATAGA GATTGGTGTt AAACGTGGAT TATATTCAAA TGAGGCTGGT	840
20	CAAGGTACAG GTCCACACGC AGCAGCGGCa gcAGaAGTAT CACATCCAAG TAAACAAGGT	900
	CTAGTACAAG CATTTTCAGT TTATATTGAT ACATTATTtG TATGTACTGC AACTGCTCTG	960
	ATTATACTTA TTTCTGGTAC ATATAATGTG ACTGATGGTA CGGTTAATGC GAATGGCACA	1020
25	CCGCATTTAA TTAAAGATGG CCGTATTTAT GTTgAAAATG CAACAGGTAA AGATTATTCA	1080
	GGTACTGCGA TGTATGCACA AGCCGGCAt GATAAAGCGT TCCATGGCAG TGGTTATCAA	1140
	TTTGATCCTA CTTTCTCTGG CGTAGgTTCG TACTTTATTG cATTtGCTTT ATTCTTCTTT	1200
30	GCATTTACTA CAATTTTGTG GTACTACTAC ATTACAGAAA CAAATGTTGC TTATTTAACG	1260
	CGTAATCAAA ATAATCAAGT TTCATCGATA TTTATTAATA TTGCTCGTGT GATTATTTTG	1320
	TTGCTACAT TTTACGGTGC AGTTAAACA GCTGATGTAG CATGGGCATT CGGTGATTtA	1380
35	GGTGTAGGTC TAATGGCTTG GTTAAATATC ATTGCGATTt GGATTTTACA TAAGCCTGCC	1440
	GTA AT ATGCTT TAAAAGATTA TGAAATTCAA AAGAAACGTT TAGGCAACGG TTATAATGCA	1500
40	GTtTATCAAC CTGATCCGAA TAAATTACCT AATGCTGTCT TTTGGTTGAA GACGTATCCA	1560
	GAACGTTTAA AACAAGCACG TGCCAAAAAG TAATCTACTT TGTTTATAG TATATGTAGT	1620
	GATCATTTGA TAAAAAGAA AAGTATTGAG AATTTTAGGt GCTCAGAAAT TTGAATTTA	1680
45	AAAATATAGT GTCTCTTGGT ACAATAACAA TACAATACT AGGGGCACTT TTTTATGTCA	1740
	GAATTTAAAA CTGGTAAGAT TAATAAACAT GTTTTATATA GTAATATTTT AAATAGAGAT	1800
	GTCACGTtAA GTATTTATTT ACCAGAATCT TATAATCAAC TTGTTAAATA TAATGTCATT	1860
50	CTTTGCTTTG ACGGATTAGA TTTTtTACGT TTCGGGAGAA TACAACGTAC ATATGAATCG	1920
	TTAATCAAAG AAGCGCGTAT TGATGATGCG ATCATtGTTG GATTCCATTA TGAAGACGTT	1980

55

EP 0 786 519 A2

	GTCGGTAAAG AAATATTGCC ATTTATTGAC TCGACGTTTT CTACACTGAA AGTAGGTAAT	2100
	GCAAGGTTAT TAGTAGGGGA TAGTTTAGCG GGTAGTATTG CCTTATTAAC GCGGTTGACC	2160
5	TATCCAACGA TTTTGTAGTCG TGTAGCAATG TTAAGTCCAC ATTCAGATGA AAAAGTATTA	2220
	GATAAGCTAA ATCAATGTGC AAATAAAGAA CAATTGACAA TTTGGCATGT CATTGGTCTA	2280
	GATGAAAAAG ATTTTACTTT ACCAACAAAT GGTAAGCGTG CCGATTTCTT AACACCGAAT	2340
10	AGAGAATTAG CTGAACAAAT TAAGAAATAT AATATAACTT ATTATTACGA TGAATTTGAT	2400
	GGTGGTCACC AATGGAAAGA TTGGAAACCA TTGCTGTCAG ATATATTATT GTATTTTTTA	2460
	AGTAAAAACA CAGATGATCA ACTTTATGAA TAATTTACAT TAGTAGATTT AGTATGAATT	2520
15	GTCTTCATAT AGTCTGGTCT ATAATATAAT TTATAAAGA TTTTACTGTT TAATTTAATT	2580
	TAAATTTGAC GAAATTGCAA AAGATGTATA ATGAATTATT TTTAATGTAA CGGTTTTCAA	2640
20	AGAAATTTGA TATAATAGCA ATAGGTTAAA CAAAGGAGGA ATTCAGATGA TTTTAGGATT	2700
	AGCATTAATT CCATCAAAGT CATTTCAAGA AGCGGTGGAT TCTTACCGTA AAAGATATGA	2760
	TAAACAGTAT TCACGAATTA AACCACATGT GACAATTAAA GCGCCATTTG AAATTAAAGA	2820
25	TGGTGATTTA GATTCTGTCA TTGAACAGGT TAGAGCTCGT ATTAATGGTA TACCAGCAGT	2880
	AGAAGTTCAT GCTACAAAAG CTTCTAGCTT CAAACCAACG AACAATGTGA TTTACTTTAA	2940
	AGTTGCGAAG ACGGACGACT TAGAAGAATT GTTTAATCGC TTTAATGGAG AAGATTTCTA	3000
30	TGGAGAAGCT GAACATGTTT TTGTGCCACA CTTTACAATA GCACAAGGAC TATCTAGCCA	3060
	AGAATTCGAA GATATTTTTG GTCaAGTAGC ATTAGCTGGG GTAGACCaTA AAGAAATTAT	3120
	CGATGAATTA ACTTTGTTAC GTTTTGACGA TGACGAAGAT AAATGGAAAG TTATTGAAAC	3180
35	GTTTAAATTA GCTTAAGTAA CATAATAGTA TTGTTAATCG TAGTATGTTT GAATTAATAA	3240
	GAAAATGGTC ATTTTATTG AATGTAATAA AAATGACCAT TTTCTTTATT TTAAAATACG	3300
	TTTTAACCTT ACTTAGCTTT TTCTCTATTT ACTATAAAGT rGCTTCCATA AAATACAGCT	3360
40	AAGACTAAAA AGATTAATGC CGAGAAATAA AATGTATTGT TTAAATTGTT GGTAAATTGT	3420
	GTAATTAATC CGCCAAATAA TGGCCCTATC ATTGAGCCGA ATCCTTGGAT ACTATTAAAA	3480
45	ACACCCCAAG TTTCTTCTTG TTCATCTGAT TTGATAAATC GTGCCATAAA GGTATTCCAT	3540
	GCTGGTAATA AGATGCCATA CATTAGACCG ATAGCTAAAG CGATAATCCA CAAGATGTGA	3600
	ATATTAACAA TCATAGATAG AGTAAAAATT AATATCATGT ATAAAATAAA TCCGCTTAGA	3660
50	ATAACACCAT ACATAAAGTT TCTGCTGCGG TTATCTATTA GTTTCGATAA AAATAGCATC	3720
	GAAACTGCAC AGCCGATACC ACCAATAATG ATTGCAACAG TATATTCAAT TGTGCTTACG	3780

55

	TGTAAAAGAA TACCAGGGAA CaACAATAAA TGGcGCTTTG TCACATCAAC AATTTGTCTC	3900
	AATTGAGCTT TAACTGGACG AGTATTATAA TTTGTTAACT TTACATCGAC AAAATAATAT	3960
5	AATATCCATG CAATTAAAC GACTAAAGAC ATCATGAAGG CAAAGCGTGT TGGGTGCACT	4020
	TTGATAAGTA GATTCATAAA AACCATACCT ACCAATAGGC CTAACAACCA TGAAAAATAA	4080
10	ACATAGCCCA TTTGTTTGCC ACGTTTATCT TCTTCAACAC TGGATAACAT AATGACCCAA	4140
	ATAGGACTAA CTGCAATACC GAGCATCATA GCACTAAATA TGATTACAAA AGGTGATGCT	4200
	GGAAACCAAA TAACTAAAA TAACTTGTA AATGCTAAAA TAAATCCAGT CGTTAAAACG	4260
15	ATTTTTGTGC CGAATTTTTT CAGTAAAAAT CCTATAACAA AGTTTGTAGA TGCATCAGCA	4320
	ATAAAATGTA TTGAAATGC TAGAGACGTT ATTGCTACAG CAATGGATGT AACTGTTGGC	4380
	AAGAAATTAA TATAGCTTAG GATATACATG CCTCTCGCAA ATTCCATTAA AAATAAGATA	4440
20	ATAAGCaTTA AAATGAAATT TTTATGATTA GCGTAATTAT TTAACGAAGA ATCTTGcATA	4500
	TAAAGGAACC TTTCCATAAA TCTCTGTGG TTGTGATGAA TGACCGATTA AATCAAGTAA	4560
	GTCTCGACAT ATTGTCTGTG TAGCATACTT AATTTTATCT TGTTCATTG TACTAATCAT	4620
25	GTTAGTTAAT TGCTCATTAC CGTTAGTTAA ACTTGCTACA ATTTTTATTG CTTCTTCTGG	4680
	AGTATCAGCG ATTTTACCAA AACCTTTTTT TCcAAAGTAA AGGGCATTIT CAAGCTCTTG	4740
	ACCAGGTGCA GGATTTAGGA AAATCATTGG AATACAACGG GCGAAACCTT CAGTTATTGT	4800
30	GATACCACCA GGTTCGTAA TCATAAGTTG ACTTGATGCC ATCCATTcAT TCATGTGTTT	4860
	GGTATAACCT AGAATCAATA CATTCTCGTT AGATTTAAC TTAGCTGTTA AAGAACGCTT	4920
	TAGCTCTTTG CTCTTACCAC AAATCATAAC TACTTGTGCA TTTGCaCTTT tCGCTAATAT	4980
35	ATCAGTAATC ATCGTGTCAA AACCTTTAGA TACACCAAAT GCACCAGCTG aCATTAAAAAT	5040
	AGTTTGCTTA TCTGGATCTA AGTTGTTGTC TATTAACCAC TGCTTTTGAT TAATAGGCGT	5100
40	TTCAAATTTG TTATCAATAG GAATACCTGT CaCTTTAACT GTTGAAGGAT CAATACCTAC	5160
	GTCTATGAAG TCTTGTTTCG TTTCTTTTGT TGCCACATAA TATCTTGTTG AATACGGCGT	5220
	AATCCAGTTT TTATGTAAGC GATAGTCTGT CATCACTGTA GCAACTGGAA TATTAATGTT	5280
45	AAATTGCTCA GTTAGTACCG ACATAACTGG TGTAGGAAAC GTTAATAATA TTAAATCTGG	5340
	CTTTTCTTTT ATCAATAAAT TAATTAACTT ATTAAGTCCA TAGTATTTGT AAAACATTT	5400
	GTCTAGTTTA TCTGGGCGGC TGTAATAAAA CCCTTTGTAC ATATTTCTAA AATATTTAAA	5460
50	GCTATTGATA TACCATTTTT TACAAATAGA AGTCAAAATT GGATGAGCTT CCATAAATAA	5520
	ATCGTGCTCA ATGACGCTTA AATGGTCTAG ATTCATATCA TTAAGTTGAT TAACGATACT	5580

55

EP 0 786 519 A2

	TTGAGTAACC ATTAATAGCC ACCCTCCGTT AGTTTGAAAA TTTTATTTAA GTGTAACCTTA	5700
	TTTTACGGCA TTATAAAAGA AATAAAGACG CAAAGTCGTT ACATTTATAG CAATTTTAAT	5760
5	CTATAGATGA ATTGATACAA AATAAAACGT TATTTTATAA AGCAATTTAT TGTCTATGT	5820
	TTTATTGTGA TATTTAAAT TATCCAGTAT ACAATTATAG CATATTTTG GAAACAATTA	5880
	TGATATTATA CCATGTTACA AGATGGTTTT AATAATTTAA GATGAGCCAT AATTGTAAAA	5940
10	CTAATTCATA ATACCGTATG TTTTATTTTT AATAGTAGAA ATTAGAAAAT GCTGATTAGT	6000
	AGGATATAAC AGTGAAATTA TAAATTTATT AACATCAACA AAACGTGTAT AATAAACATA	6060
15	TTGTAGAAAA AGGAGCGGTT CAGTTTGGAT GCAAGTACGT TGTTTAAGAA AGTAAAGTA	6120
	AAGCGTGTAT TGGGTTCTTT AGAACAACAA ATAGATGATA TCACTACTGA TTCACGTACA	6180
	GCGAGAGAAG GTAGCATTTT TGTCGCTTCA GTTGATATA CTGTAGACAG TCATAAGTTC	6240
20	TGTCAAATG TAGCTGATCA AGGGTGTAAG TTGGTAGTGG TCAATAAAGA ACAATCATT	6300
	CCAGCTAACG TAACACAAGT GGTGTGCGG GACACATTAA GAGTAGCTAG TATTCTAGCA	6360
	CACACATTAT ATGATTATCC GAGTCATCAG TTAGTGACAT TTGGTGTAaC GGGTACAAAT	6420
25	GGTAAACTT CTATTGCGAC GATGATTCAT TTAATTCAAA GAAAGTTACA AAAAAATAGT	6480
	GCATATTTAG GAACTAATGG TTTCCAAATT AATGAAACAA AGACAAAAGG TGCAAATACG	6540
	ACACCAGAAA CAGTTTCTTT AACTAAGAAA ATTAAAGAAG CAGTTGATGC AGGCGCTGAA	6600
30	TCTATGACAT TAGAAGTATC AAGCCATGGC TTAGTATTAG GACGACTGCG AGGCGTTGAA	6660
	TTTGACGTTG CAATATTTTC AAATTTAACA CAAGACCATT TAGATTTTCA TGGCACAATG	6720
	GAAGCATACG GACACGCGAA GTCTTTATTG TTTAGTCAAT TAGGTGAAGA TTTGTCGAAA	6780
35	GAAAAGTATG TCGTGTTAAA CAATGACGAT TCATTTTCTG AGTATTTAAG AACAGTGACG	6840
	CCTTATGAAG TATTTAGTTA TGGAATTGAT GAGGAAGCCC AATTTATGGC TAAAAATATT	6900
	CAAGAATCTT TACAAGGTGT CAGCTTTGAT TTTGTAACGC CTTTGGAAAC TTACCCAGTA	6960
40	AAATCGCCTT ATGTTGGTAA GTTTAATATT TCTAATATTA TGGCGGCAAT GATTGCGGTG	7020
	TGGAGTAAAG GTACATCTTT AGAAACGATT ATTAAAGCTG TTGAAAATTT AGAACCTGTT	7080
45	GAAGGGCGAT TAGAAGTTTT AGATCCTTCG TTACCTATTG ATTTAATTAT CGATTATGCA	7140
	CATACAGCTG ATGGTATGAA CAAATTAATC GATGCAGTAC AGCCTTTTGT AAAGCAAAAG	7200
	TTGATATTTT TAGTTGGTAT GGCAGGCGAA CGTGATTAA CTAAAACGCC TGAAATGGGG	7260
50	CGAGTTGCCT GTCGTGCAGA TTATGTCATT TTCACACCGG ATAATCCGGC AAATGATGAC	7320
	CCGAAAATGT TAACGGCAGA ATTAGCCAAA GGTGCAACAC ATCAAAACTA TATTGAATTT	7380

55

	GTTTTCAGCAT CAAAAGGAAG AGAACCATAT CAAATCATGC CAGGGCATAT TAAGGTGCCA	7500
	CATCGAGATG ATTTAATTGG CCTTGAAGCA GCTTACAAAA AGTTCGGTGG TGGCCCTGTT	7560
5	GATTAATAAA AGATTTATTG ATGAAGGTAA AACTATTGAT GTTTATTTAT TCGAAGCATT	7620
	AAATAACCAG ATAATCATTG CTATACCAGA TTGGTTTTGG TCATATCAGA TGGCAATGAC	7680
	ATTAGATGAA GAAACTTGTT TTGAAGCAAT ACTCATGCAA TTGTTTGTTT TTAAAGAAGA	7740
10	GGAAGAGGCA GAATCGATTG CATCACAACCT AACAGATTGG ATAGAAACAT ATAAAAAGGA	7800
	GAAAGACTAA TGAACCTAAA GCAAGAAGTT GAGTCTAGAA AGACTTTTGC GATTATTTCA	7860
	CATCCCGATG CAGGGAAAAC AACGTTAACT GAAAAACTAT TGTACTTCAG TGGTGCTATT	7920
15	CGTGAAGCGG GTACAGTTAA AGGGAAGAAG ACTGGTAAAT TTGCGACAAG TGACTGGATG	7980
	AAAGTTGAAC AAGAGCGTGG TATTTCTGTA ACTAGTTCAG TAATGCAATT TGATTACGAT	8040
	GATTATAAAA TCAATATCTT AGATACACCA GGACATGAAG ACTTTTCAGA AGATACGTAT	8100
20	AGAACATTAA TGGCAGTTGA CAGTGCTGTC ATGGTCATAG ACTGTGCAAA AGGTATTGAA	8160
	CCACAAACAT TGAAGTTATT TAAAGTTTGT AAAATGCGTG GTATTCCAAT CTTTACATTC	8220
25	ATTAATAAAT TAGACCGAGT AGGTAAAGAA CCATTTGAAT TATTAGATGA AATCGAAGAG	8280
	ACATTAAATA TTGAAACATA CCCTATGAAT TGGCCAATTG GTATGGGACA AAGTTTCTTT	8340
	GGCATCATTG ATAGAAAGTC TAAACAATT GAACCATTTA GAGATGAAGA AAATATATTA	8400
30	CATTTGAATG ATGATTTTGA GTTGAAGAA GATCATGCAA TTACAAATGA TACTGATTTT	8460
	GAACAAGCGA TTGAAGAATT AATGTTGGTT GAAGAAGCGG GTGAAGCCTT TGATAATGAC	8520
	GCGCTGTTGA GTGGAGACTT AACACCTGTA TTTTTCGGTT CAGCTTTAGC TAACTTTGGT	8580
35	GTACAAAATT TCTTAAATGC ATATGTTGAT TTTGCGCCAA TGCCAAATGC GAGACAAACA	8640
	AAAGAGACG TTGAAGTAAG CCCGTTTGAT GATTCATTTT CAGGATTTAT CTTTAAATTT	8700
	CAAGCCAACA TGGACCCTAA ACACCGTGAT AGAATTGCCT TTATGCGTGT CGTTAGTGGT	8760
40	GCATTTGAAC GTGGTATGGA TGTTACTTTG CAACGTACTA ATAAAAAGCA AAAGATCACA	8820
	CGTTCAACGT CATTTATGGC AGACGATAAA GAACTGTGA ATCATGCTGT AGCAGGCGAT	8880
	ATCATTGGAC TATATGATAC TGTAATTAT CAAATTGGAG ATACTTTAGT TGGTGGAAAA	8940
45	CAAACCTACA GTTTCCAAGA TTTACCACAA TTTACGCCAG AAATTTTAT GAAAGTTTCT	9000
	GCTAAAAACG TCATGAAACA GAAGCATTTT CATAAAGGTA TTGAACAATT AGTACAAGAA	9060
50	GGTGCATTC AATACTATAA AACATTACAC ACAAAACAAA TTATTTTAGG TGCTGTTGGT	9120
	CAGTTACAAT TTGAAGTTTT CGAACATAGA ATGAAAAACG AATATAATGT TGATGTTGTT	9180

55

EP 0 786 519 A2

	AAGATGAACA CATCAAGATC GATTTTAGTG AAAGATAGAT ATGACGATTT AGTATTCTTA	9300
	TTTGAAAATG AATTTGCAAC AAGATGGTTT GAAGAGAAAT TCCCTGAAAT TAAATTGTAT	9360
5	AGTTTACTTT AACAGCTCAA TTGTATAATC GAATTTGTTA CATTAAAAAT AATTGTTTCG	9420
	TTGAAGAAAA ATAAATTGTA TATTTTAAAA GAAAAAGGTA TACTATGATG TATCAAATGA	9480
10	ATAACCTATG GCATTTTGTC AGAGGGGAGT AACTTAAGAA TCATGACCGT ATAAATGaTT	9540
	CGACACTTTA TCGTCATTAC GARGATATCT TCCGGTAAAG TGGGCAATTT AAATTGCTTA	9600
	GTGAGACCTT TGCTATTTAT TTAGCATAGG TCTTTTGTGTT TGTACTTAAC TTATTTATTT	9660
15	AAAGGAGTTG TACATGTTAA TGGATCCAAG TTTGATCTTA CCTTATTTAT GGGTACTTGT	9720
	CGTTTTAGTA TTTTLAGAAG GCTTATTAGC AGCAGATAAC GCGATTGTTA TGGCTGTAAT	9780
	GGTTAAGCAC TTACCACCCG AACAACTGTA AAAAGCTTTG TTTTACGGTT TGTTAGGTGC	9840
20	ATTTGTATTT AGATTTTLAG CATTATTCTT AATTAGTATT ATCGCGAACT TTTGGTTTAT	9900
	TCAAGCTGCA GGAGCGGTTT ACTTAATTTA TATGTCAATC AAAAATCTGT GGCAGTTCTT	9960
	TAAACACCCA GAAATTGAAA GTCCTGAAGC TGGAGATGAT CATCATTATG ATGAATCTGG	10020
25	TGAAGAGATT AAAGCAAGTA ACAAATCATT CTGGGGAAC GTGTTGAAAA TAGAATTTGC	10080
	AGATATCGCA TTTGCCATTG ATTCTATGCT TGCTGCTTTA gCTATTGCTG TAACACTTCC	10140
30	TAAAGTTGGT ATTCACTTTG GTGGTATGGA CTTAGGTCAG TTCGTAGTCA TGTTCCTAGG	10200
	TGGAATGATT GGTGTTATTC TAATGCGTTA TGCAGCAACA TGGTTTGTAG AGCTATTAAA	10260
	CAAATATCCA GGACTTGAAG GTGCAGCCTt CGCGATCGTT GGTGGGGTAG GTGTTAAATT	10320
35	AGTTGTCATG GTATTAGCGC ACCCAGACAT CGCTGTATTG CCTGAGCACT TCCCACATGG	10380
	CGTATTATGG CAATCTATTT TCTGGACAGT ACTAATTGGA TTAGTAATTA TCGGTTGGTT	10440
	AGGTTTCAGTT GTTAAAAATA AAAAATCGCA TAAATAATTG ATGTGAAGCG GACAATCTTA	10500
40	ATTTAGTTTA AGGTTGTCCT TTTTCATTTA ATTGAGTGAT TTATGAAAAA TGGATTTTGA	10560
	AGAATGTGAA TCAAAAGATG CGATATAGTA TTAAGAAAAT GTGCCTTTTA TATTTAGCAT	10620
	TTTTTCAATA GAAATTATAT AGATTTTAAA GCAAATTAGG TGTTAATGTG TCATAATGAT	10680
45	AAGTGATTTT ATTGAATGGA GTGGACATTA GTGGATATTG GTAAAAACA TGTAATTCCT	10740
	AAAAGTCAGT nACCSaCGTA AGCGTCGTGA ATTCTTCCAC AACGAAGACA GAGAAGAAAA	10800
50	TTTAAATCAA CATCAAGATA AACAAAATAT AGATAATACA ACATCAAAAA AAGCAGATAA	10860
	GCAAATACAT AAAGATTCAA TTGATAAGCA CGAACGTTTT AAAAATAGTT TATCATCGCA	10920
	TTTAGAACAG AGAAACCGTG ATGTTAATGA GAATAAAGCT GAAGAAAGTA AAAGTAATCA	10980

55

AAATTCATTA GATTCAGTGG ACCAAGATAC AGAGAAATCA AAATATTATG AGCAAAATTC 11100
 TGAAGCGACT TTATCAACTA AATCAACCGA TAAAGTAGAA TCAACTGAAA TGAGAAAGCT 11160
 5 AAGTTCAGAT AAAACAAAG TTGGTCATGA AGAGCAACAT GTACTTTCTA AACCTTCAGA 11220
 ACATGATAAA GAGACTAGAA TTGATTCTGA GTCTTCAAGA ACTGATTCAG ACAGCTCGAT 11280
 GCAGACAGAG AAAATAAAAA AAGACAGTTC AGATGGAAAT AAAAGTAGTA ATCTGAAATC 11340
 10 TGAAGTAATA TCAGACAAAT CAAATACAGT ACCAAAATTG TCGGAATCTG ATGATGAAGT 11400
 AAATAATCAG AAGCCATTAA CTTTACCGGA AGAACAGAAA TTGAAAAGAC AGCAAAGTCA 11460
 15 AAATGAGCAA ACAAAAACCT ATACATATGG TGATAGCGAA CAAAATGACA AGTCTAATCA 11520
 TGAAAATGAT TTAAGTCATC ATATACCATC GATAAGTGAT GATAAAGATA ACGTCATGAG 11580
 AGAAAATCAT ATTGTTGACG ATAATCCTGA TAATGATATC AATACACCAT CATTATCAAA 11640
 20 AACAGATGAC GATCGAAAAC TTGATGAAAA AATTCATGTT GAAGATAAAC ATAAACAAAA 11700
 TGCAGACTCG TCTGAAACGG TGGGATATCA AAGTCAGTCA ACTGCATCTC ATCGTAGCAC 11760
 TGAAAAAAGA AATATTTCTA TTAATGACCA TGATAAATTA AACGGTCAAA AAACAAATAC 11820
 25 AAAGACATCG GCAAATAATA ATCAAAAAAA GGCTACATCA AAATTGAACA AAGGGCGCGC 11880
 TACGAATAAT AATTATAGTG ACATTTTGAA AAAGTTTTGG ATGATGTATT GGCCTAAATT 11940
 AGTTATTCTA ATGGGTATTA TTATTCTAAT TGTTATTTTG AATGCCATTT TTAATAATGT 12000
 30 GAACAAAAAT GATCGCATGA ATGATAATAA TGATGCAGAT GCTCAAAAAT ATACGACAAC 12060
 GATGAAAAAT GCCAATAACA CAGTTAAATC GGTCGTTACA GTTGAAAATG AAACATCAAA 12120
 35 AGATTCmTCA TTACCTAAAG ATAAAGCATC TCaAGACGAA GTGGGATCAG GTGTTGTATA 12180
 TAAAAAATCT GGAGATACGT TATATATTGT TACGAATGCA CACGTTGTCG GTGATAAAGA 12240
 AAATCaAAAA ATAACCTTCT CGAATAATAA AAGTGTGTTT GGGAAAGTGC TTGGTAAAGA 12300
 40 TAAATGGTCA GATTTAGCTG TTGTTAAAGC AACTTCTTCA GACAGTTCAG TGAAAGAGAT 12360
 AGCTATTGGA GATTCAAATA ATTTAGTGTT AGGAGAGCCA ATATTAGTCG TAGGTAATCC 12420
 ACTTGGTGTA GACTTTAAAG GCACTGTGAC AGAAGGTATT ATTTCAGGTC TGAACAGAAA 12480
 45 TGTTCTTATT GATTTGATA AAGATAATAA ATATGATATG TTGATGAAAG CTTTCCAAAT 12540
 TGATGCATCA GTAAATCCAG GTAACCGG TGGTGCTGTC GTCAATAGAG AAGGAAAATT 12600
 50 AATAGGTGTA GTTGCAGCTA AAATTAGTAT GCCAACGTT GAAAnTATGT CATTTGCA 12658

(2) INFORMATION FOR SEQ ID NO: 128:

(1) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6048 base pairs

55

(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 128:

	TGAAATnGAA TAGTACTATT GCAAGTGTAAGAGGTTAAT TTTTGCCnCA CGCGGGACTT	60
10	AAAAAGGCAA CCACTGGTTG TGACATATCC TTATTTACAT TTATAAATAT AAGGAGGAGG	120
	TAGTAGTGAA AGACTTATTG CAAGCACAGC AAAAGCTTAT ACCGGATCTC ATAGATAAAA	180
	TGTATAAACG TTTTCTATT CTTACTACTA TCTCAAAAA TCAGCCTGTC GGACGTCGAA	240
15	GTTTAAGCGA ACATATGGAT ATGACTGAAC GTGTACTGCG TTCTGAAACA GATATGCTTA	300
	AGAAACAAGA TTTGATAAAA GTTAAGCCTA CCGGAATGGA AATTACAGCT GAAGGTGAGC	360
	AACTGATTTT GCAATTGAAA GGTTACTTTG ATATCTATGC AGATGATAAT CGTCTGTCAG	420
20	AAGGTATTAA GAATAAATT CAAATTAAGG AAGTTCATGT TGTTCTGGT GATGCTGATA	480
	ATAGTCAATC TGTTAAAACA GAATTAGTA GACAAGCAGG TCAATTACTT GAAGGCATAT	540
	TACAAGAAGA CGCGATAGTT GCTGTAAC TGCGATCCAC GATGGCATGT GTTAGTGAAG	600
25	CAATTCATTT ATTACCATAT AATGTATTCT TCGTACCAGC CAGAGGTGGA CTAGGCGAAA	660
	ATGTTGTCTT TCAGGCAAAC ACAATTGCAG CCAGTATGGc aCAACAAGCT GGCGGTTATT	720
30	ATACGACGAT GTATGTACCT GATAATGTCA GTGAAaCAAC ATATAATACA TTGTTGTTAG	780
	AGCCATCAGT CATAAACACT TTAGACAAAA TTAAACAAGC AAACGTTATA TTACACGGCA	840
	TTGGTGATGC GCTGAAGATG GCGCATCGAC GTCAATCACC TGAAAAGGTC ATTGAACAAC	900
35	TTCAACATCA TCAAGCTGTC GGAGAGGCAT TTGGTTATTA TTTTGATACA CAAGGTCAAA	960
	TTGTCCATAA GGTTAAAACA ATTGGACTTC AATTAGAAGA CCTTGAATCA AAAGACTTTA	1020
	TTTTTGAGT TGCAGGAGGC AAATCGAAAG GTGAAGCAAT TAAAGCATAC TTGACGATTG	1080
40	CACCCAAGAA TACAGTGTTA ATCACTGATG AAGCCGAGC AAAGATAATA CTTGAATAAG	1140
	AGATAAAAAG TTTAATACTT TTTAAATATC ATTTTAAAGG AGGCCATTAT AATGGCAGTA	1200
45	AAAGTAGCAA TTAATGGTTT TGGTAGAATT GGTCGTTTAG CATTGAGAAG AATTCAAGAA	1260
	GTAGAAGGTC TTGAAGTTGT AGCAGTAAAC GACTTAACAG ATGACGACAT GTTAGCGCAT	1320
	TTATTAAAT ATGACACTAT GCAAGGTCGT TTCACAGGTG AAGTAGAGGT AGTTGATGGT	1380
50	GGTTTCCGCG TAAATGGTAA AGAAGTTAAA TCATTCAAGT AACCAGATGC AAGCAAATTA	1440
	CCTTGGAAG ACTTAAATAT CGATGTAGTA TTAGAATGTA CTGGTTTCTA CACTGATAAA	1500
	GATAAAGCAC AAGCTCATAT TGAAGCAGGC GCTAAAAAAG TATTAATCTC AGCACCAGCT	1560

55

EP 0 786 519 A2

	ACAGTTGTTT CAGGTGCTTC ATGTACTACA AACTCATTAG CACCAGTTGC TAAAGTTTTA	1680
	AACGATGACT TTGGTTTAGT TGAAGGTTTA ATGACTACAA TTCACGCTTA CACAGGTGAT	1740
5	CAAAATACAC AAGACGCACC TCACAGAAAA GGTGACAAAC GTCGTGCTCG TGCAGCGGCA	1800
	GAAAACATCA TCCCTAACTC AACAGGTGCT GCTAAAGCTA TCGGTAAAGT TATTCCTGAA	1860
10	ATCGATGGTA AATTAGATGG TGGTGCACAA CGTGTTCCTG TAGCTACAGG TTCATTAACT	1920
	GAATTAACAG TAGTATTAGA AAAACAAGAC GTAACAGTTG AACAAAGTTAA CGAAGCTATG	1980
	AAAAATGCTT CAAACGAATC ATTCGGTtAC ACTGAAGACG AAATCGTTTC TTCAGACGTT	2040
15	GTAGGTATGA CTTACGGTTC ATTATTTCGAC GCTACACAAA CTCGTGTAAT GTCAGTTGGC	2100
	GACCGTCAAT TAGTTAAAGT TGCAGCTTGG TATGATAACG AAATGTCATA TACTGCACAA	2160
	TTAGTTCGTA CATTAGCATA CTTAGCTGAA CTTTCTAAAT AATTTTAGTA TAGTTTTTAT	2220
20	TCAAATACGC TAGTGCTCAG AACTATTTAG CATTAAATTAA AGCTTATGAG TAAGCGGGGA	2280
	GCACAAACGC TTCTCCGCTT ATTTTATAT AAAATTTCTT AATTACAAGG AGGAAACACC	2340
	ATGGCTAAAA AAATTGTTTC TGATTTAGAT CTTAAAGGTA AAACAGTCCT AGTACGTGCT	2400
25	GATTTTAACG TACCTTTAAA AGACGGTGAA ATTACTAATG ACAACCGTAT CGTTCAAGCT	2460
	TTACCTACAA TTCAATACAT CATCGAACAA GGTGGTAAAA TCGTACTATT TTCACATTTA	2520
30	GGTAAAGTGA AAGAAGAAAG TGATAAAGCA AAATTAACCT TACGTCCAGT TGCTGAAGAC	2580
	TTATCTAAGA AATTAGATAA AGAAGTTGTT TTCGTACCAG AAACACGCGG CGAAAACTT	2640
	GAAGCTGCTA TTAAAGACCT TAAAGAAGGC GACGTATTAT TAGTTGAAAA TACACGTTAT	2700
35	GAAGATTTAG ACGGTAAAAA AGAATCTAAA AATGATCCAG AATTAGGTAA ATACTGGGCA	2760
	TCTTTAGGTG ATGTGTTTGT AAATGATGCT TTTGGTACTG CGCATCGTGA GCATGCATCT	2820
	AATGTTGGTA TTTCTACACA TTTAGAAACT GCAGCTGGAT TCTTAATGGA TAAAGAAATT	2880
40	AAGTTTATTG GCGGCGTAGT TAACGATCCA CATAAACCAG TTGTTGCTAT TTTAGGTGGA	2940
	GCAAAAGTAT CTGACAAAAT TAATGTCATC AAAAAGCTAG TTAACATAGC TGATAAAATT	3000
	ATCATCGGCG GAGGTATGGC TTATACTTTC TTAAAAGCGC AAGGTAAAGA AATTGGTATT	3060
45	TCATTATTAG AAGAAGATAA AATCGACTTC GCAAAAGATT TATTAGAAAA ACATGGTGAT	3120
	AAAATTGTAT TACCAGTAGA CACTAAAGTT GCTAAAGAAT TTTCTAATGA TGCCAAAATC	3180
50	ACTGTAGTAC CATCTGATTC AATTCCAGCA GACCAAGAAG GTATGGATAT TGGACCAAAC	3240
	ACTGTAAAT TATTTGCAGA TGAATTAGAA GGTGCGCACA CTGTTGTATG GAATGGACCT	3300
	ATGGGTGTAT TCGAGTTCAG TAACTTTGCA CAAGGTACAA TTGGTGTATG TAAAGCAATT	3360

55

	TCTTTAGGTT TTGAAAATGA CTTCACTCAT ATTTCAACTG GTGGCGGCGC GTCATTAGAG	3480
	TACCTAGAAG GTAAAGAATT GCCTGGTATC AAAGCAATCA ATAATAAATA ATAAAGTGAT	3540
5	AGTTTAAAGT GATGTGGCAT GTTTGTTTAA CATTGTTACG GGAAAACAGT CACAAGATGA	3600
	CATCGTGTTT CATCACTTTT CAAAAATATT TACAAAACAA GGAGTGTCTT TAATGAGAAC	3660
10	ACCAATTATA GCTGGTAACT GGAAAATGAA CAAAACAGTA CAAGAAGCAA AAGatTCGTC	3720
	AATACATTAC CAACACTACC AGATTCAAAA GAAGTAGAAT CAGTAATTTG TGCACCAGCA	3780
	ATTCAATTAG ATGCATTAAC TACTGCAGTT AAAGAAGGAA AAGCACAAGG TTTAGAAATC	3840
15	GGTGCTCAAA ATACGTATTT CGAAGATAAT GGTGCGTTCA CAGGTGAAAC GTCTCCAGTT	3900
	GCATTAGCAG ATTTAGGCGT TAAATACGTT GTTATCGGTC ATTCTGAACG TCGTGAATTA	3960
	TTCCACGAAA CAGATGAAGA AATTAACAAA AAAGCGCAGC CTATTTTCAA ACATGGAATG	4020
20	ACTCCAATTA TATGTGTTGG TGAAACAGAC GAAGAGCGTG AAAGTGGTAA AGCTAACGAT	4080
	GTTGTAGGTG AGCAAGTTAA GAAAGCTGTT GCAGGTTTAT CTGAAGATCA ACTTAAATCA	4140
	GTTGTAATTG CTTATGAACC AATCTGGGCA ATCGGAACTG GTAAATCATC AACATCTGAA	4200
25	GATGCAAATG AAATGTGTGC ATTTGTACGT CAACTATTG CTGACTTATC AAGCAAAGAA	4260
	GTATCAGAAG CAACTCGTAT TCAATATGGT GGTAGTGTTA AACCTAACAA CATTAAAGAA	4320
	TACATGGCAC AAAGTATAT TGATGGGGCA TTAGTAGGTG GCGCATCACT TAAAGTTGAA	4380
30	GATTTTCGTAC AATTGTTAGA AGGTGCAAAA TAATCATGGC TAAGAAACCa ACTGCGTTAA	4440
	TTATTTTAGA TGGTTTTGCG AACCGCGAAA GCGAACATGG TAATGCGGTA AAATTAGCAA	4500
35	ACAAGCCTAA TTTTGATCGT TATTACAACA AATATCCAAC GACTCAAATC GAAGCGAGTG	4560
	GCTTAGATGT TGGACTACCT GAAGgACAAA TGGGTAACCTC AGAAGTTGGT CATATGAATA	4620
	TCGGTGCAGG ACGTATCGTT TATCAAAGTT TAACTCGAAT CAATAAATCA ATTGAAGACG	4680
40	GTGATTTCTT TGAAAATGAT GTTTTAAATA ATGCAATTGC ACACGTGAAT TCACATGATT	4740
	CAGCGTTACA CATCTTTGGT TTATTGTCTG ACGGTGGTGT ACACAGTCAT TACAAACATT	4800
	TATTTGCTTT GTTAGAACTT GCTAAAAAAC AAGGTGTTGA AAAAGTTTAC GTACACGCAT	4860
45	TTTTAGATGG CCGTGACGTA GATCAAAAAT CCGCTTTGAA ATACATCGAA GAGACTGAAG	4920
	CTAAATTCAA TGAATTAGGC ATTGGTCAAT TTGCATCTGT GTCTGGTCGT TATTATGCAA	4980
	TGGATCGTGA CAAACGTTGG GAACGTGAAG AAAAAGCTTA CAATGCTATT CGTAATTTTG	5040
50	ATGCCCCAAC TTATGCAACT GCCAAGAAG GTGTAGAAGC AAGCTATAAT GAGGGCTTAA	5100
	CTGACGAATT CGTAGTACCA TTCATCGTTG AGAATCAAAA TGACGGTGTT AATGATGGAG	5160

55

CGAACAGAGC ATTCGAAGGC TTAAAGTTG AACAAAGTTAA AGACTTATTC TATGCAACAT 5280
 TACTAAGTA TAATGACAAT ATCGATGCGG CTATCGTCTT CGAAAAAGTT GATTTAAATA 5340
 5 ATACAATTGG TGAAATTGCA CAAAATAACA ATTTAACTCA ATTACGTATT GCAGAAACTG 5400
 AAAAATACCC TCACGTTACT TACTTTATGA GTGGTGGACG TAACGAGGAA TTAAAGGTG 5460
 AACGCCGTCG TTAAATTGAT TCACCTAAAG TTGCAACGTA TGACTTGAAA CCAGAAATGA 5520
 10 GTGCTTATGA AGTTAAAGAT GCATTATTAG AAGAGTTAAA TAAAGGTGAC TTGGACTTAA 5580
 TTATTTTAAA CTTTGCTAAC CCTGATATGG TTGGACATAG TGGTATGCTT GAGCCGACAA 5640
 TCAAAGCAAT CGAAGCGGTT GATGAATGTT TAGGAGAAGT GGTGATAAG ATTTTAGACA 5700
 TGGACGGTTA TGCAATTATT ACTGCTGACC ATGCTAACTC TGATCAAGTA TTGACGGaTG 5760
 ATGATCAACC AATGACTACG CAWACAACGA ACCCAGTACC AGTGATTGTA ACAAAGAAG 5820
 20 GCGTTACACT TAGAGAACT GGTGCTTAG GTGACTTAGC ACCTACATTA TTAGATTTAT 5880
 TAAATGTAGA ACAACCTGAA GATATGACAG GTGAaTCTTT AATTAAACAC TAATATTGTA 5940
 AAAGATGTTA AGTAAACGCT TAATGACACT TATTTTTTGA AAATAATAGT AATATCnTTT 6000
 25 TGTAAATGA AAGAATAAAG CTATAATAAT TATAGAATAA CTATTTAn 6048

(2) INFORMATION FOR SEQ ID NO: 129:

(i) SEQUENCE CHARACTERISTICS:
 30 (A) LENGTH: 5602 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

35 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 129:

AAAG⁵AAGTGC AAGATATCAT CGCATTAAATT AAGTCGTTAC AAAGTGTAAT TGTAAGACaTC 60
 40 GCTTCCAATA ATGTTGATAC AATTATGCCT GGTATACTC ATTTACAGCG TGCACAGCCA 120
 ATTTCA¹⁰TTTG CACATCATAT TATGACTTAT TTTTGGATGT TACAACGAGA CCAACAACGA 180
 TTTGAAGATA GTTTAAAACG AATCGATATT AATCCTTTAG GTGCAGCAGC CTTAAGTGGT 240
 45 ACCACATACC CTATCGATAG ACACGAGACA ACAGCATTGT TGAAC¹⁵TTTG CAGTCTCTAT 300
 GAGAATAGCC TAGATGCTGT TAGTGACAGA GACTATATTA TTGAAACATT GCATAATATT 360
 TCTTTAACGA TGGTTCACTT ATCAGCCTTT GCAGAGGAAA TTATTTTCTG GTCCACAGAC 420
 50 GAAGCTAAAT TCATTACATT ATCAGATGCA TTTTCAACTG GCTCATCTAT TATGCCACAA 480
 AAGAAAAATC CTGATATGGC AGAATTAATT AGAGGTAAAG TTGGTCGAAC GACTGGTCAT 540

55

	GAAGATAAAG AAGGTTTATT CGATGCTGTC CATACAATTA AAGGTTCTTT ACGTATTTTC	660
	GAAGGTATGA TTCAAACGAT GACAATTAAT AAAGAACGAC TCAATCAAAC TGTAAAGAA	720
5	GATTTTTCATG ATGCAACGGA ACTAGCAGAT TATTTAGTAA CTAAAAATAT TCCATTTAGA	780
	ACTGCACATG AAATTGTAGG AAAAATCGTC TTAGAATGTA TACAACAAGG TCATTATTTA	840
10	TTAGATGTTT CTTTAGCAAC ATATCAACAA CATCATTCTA GTATTGATGC CGATATTTAC	900
	GATTATTTGC AGCCTGAAAA TTGTTTAAAA CGACGTCAA GTTACGGTTC AACAGGTCAA	960
	TCATCGGTCA AACACAACCT TGATGTTGCT AAACAATTAC TATCACAATA AATACGTTAA	1020
15	TCTACCTACC CACAATGTCT ATTAATAATTA CATTGTGGGT ATTTTAATGC TCTCTTCGTC	1080
	TTGTTGAACA TCACATTTTT AAGATTCCTA AAATGTTTGA TAATTCTTTT AAATTTATAT	1140
	TACAAAAATG TTATAAATTG TAAAAGAAAT GTGTAAAGCG TTTTCACAAG CAGGTTTTTG	1200
20	TAGTATTTTA AAATTGTTAG ACTACAAATA AAGAGATGAA AGGATAAAGA CTATGACTAA	1260
	CTCTTCGAAA AGCTTCACTA AATTTATGGC TGCTTCTGCT GTTTTACTA TGGGATTTTT	1320
	ATCAGTACCT ACTGCTGGCG CTGAACAAAC AAATCAAATT GCAAATAAAC CTCAGGCTAT	1380
25	TCAATGGCAT ACAAATTTAA CGAATGAGCG ATTCACTACT ATCGCACATC GTGGCGCAAG	1440
	TGGCTATGCA CCCGAGCATA CGTTTCAAGC ATATGATAAG AGTCATAATG AGTTAAAAGC	1500
30	ATCTTATATC GAAATTGATT TACAACGTAC CAAAGATGGC CATTTAGTTG CTATGCATGA	1560
	TGAAACTGTT AACCGTACAA CAAATGGACA CGGTAAAGTT GAGGATTATA CCCTTGATGA	1620
	ATTAAACAG TTAGATGCAG GAAGTTGGTT TAATAAAAAA TATCCAAAAT ACGCAAGAGC	1680
35	AAGTTATAAA AATGCTAAAG TACCCACTTT AGATGAAATT TTAGAACGTT ATGGCCCGAA	1740
	TGCAAACTAT TATATTGAAA CAAAGTCACC TGATGTATAC CCAGGAATGG AAGAACAATT	1800
	ATTAGCTTCA TTGAAAAGC ATCACCTTTT AAATAACAAT AAATTAAAAA ATGGACATGT	1860
40	AATGATTCAA TCATTTTCTG ACGAAAGTTT AAAGAAAATT CATCGTCAA ATAAGCATGT	1920
	GCCATTAGTA AAATTAGTTG ATAAAGGTGA ACTACAACAA TTTAACGACC AACGCTTAAA	1980
	AGAGATACGC TCTTATGCGA TTGGATTAGG TCCTGATTAT ACAGATTTAA CTGAACAAAA	2040
45	TACCCATCAT TTAAAAGACT TAGGATTAT AGTACATCCT TATACAGTGA ATGAAAAAGC	2100
	TGATATGTTA CGATTAAATA AATATGGCGT TGATGGTGTC TTTACAAATT TCGCTGATAA	2160
50	ATATAAGAA GTCAITTAAGT AGTAATGTTA AACTAGAAAA CATAAATACA AAAATATAGC	2220
	TATTACTATA AAAACAGCA GTAAGATATT TCCAAATTGA AATTATCCTA CTGCTGTCTT	2280
55	TTTGGGAGTG GGACAGAAAT GATATTTTCG CAAAATTTAT TTCGTCTGCC CACCCCAACT	2340

	TTGTCTGTAG AAATTGAGGA GCTAATTTCT CTGTGTCGGG GCTCCACCCC AACTTGCACA	2460
	CTATTGTAAG CTGACTTTCC GCCAGCCTCT GTGTTGGGGC CCCGCCAACT TGCACACTAT	2520
5	TGTAAGCTGA CTTTCCACCA GCCTCTGTGT TGGGGCCCCG ACTATTTTGG AAAAGAGCGT	2580
	GTTACACGGG CATTGTTTTA CAGTCAACTA CTGCTAAAT AAAATTAACG AGCTTAGGGC	2640
10	TTTGTTTTCT GTCCCAAGCT CGTTAAATCA CATATGATAA TTAATTATGC CCAACCACGA	2700
	TATCTAGCTG CTTCTGCTGT ACGTTTAATA CCTATGATAT ATGCTGCAAG TCTCATATCT	2760
	ATTTTTCGGT TTTGAGACAA TTCGTAAATC GTATCAAATG CCGCTTCTAA TTTTTCACGT	2820
15	AGCTTTTCAT TAACCTCTTC TTCAGACCAA TAATAACCTT GATTATTTTG TACCCATTCC	2880
	AAGTAAGAAA CCGTtACACC ACCAGCACTT GCTAATACGT CTGGAACATA TAATATACCA	2940
	CGTTCAGTTA AAATACGTGT TGCTTCTGGT GTTGTAGGTC CATTAGCAGC TTCAACAACG	3000
20	ATACTAGCTT TAATATCATG TGCATTGTCT TCTGTAATTT GGTTTGAAAT AGCCGCTGGT	3060
	ACTAAAATGT CACAATCTAA TTCAAACAAT TCTTTATTTG AGATTGTTTC TTCAAATAAA	3120
	TTTGTTACCG TACCAAACT ATCACGACGG TCTAATAAAT AATCTATATC TAAGCCATTT	3180
25	GGATCGTGTA ATGCACCGTA AGCATCAGAG ATACCTACAA TTTTTCACC TAAATCATAT	3240
	AAGAATTTAG CTAAGAACT TCCGGCATTa CCGAAACCTT GAATAACAAC CTTGGCACCT	3300
	TCAATTTGCA TATTACGACG TTTTGCAGCT GTTTCAATTG CAATAACTAC ACCTAGTGCA	3360
30	GTTGATCTGT CGCGTCCATG AGAACCACCC AATACAATTG GTTTACCTGT GATGAAACCT	3420
	GGTGAATTAA ATTTATCTAA TGCACTATAT TCATCCATCA TCCAAGCCAT AATTTGTGAG	3480
35	TTTGTAATA CATCTGGTGC TGGAAATATCT TTGTTCCGAC CTACGAATTG TGAAATTGCT	3540
	CTTACATATC CGCGTGATAA ACGTTCAACT TCATGAATGC TCATTTGACG TGGATCACAA	3600
	ACGATACCAC CTTACCACC ACCGTATGGT AAGTTTACAA TGCCACATTT CAAAGTCATC	3660
40	CACATTGATA ATGCTTTTAC TTCTTCTTCA TCAACATCTG GGTGGAAACG CACGCCCCCT	3720
	TTTGTGGTC CAACAGCATC ATTATGTTGC GCACGGTAAC CTGTGAATGT TTTTACTGTG	3780
	CCATCATCCA TTCGTACAGG GATACGCACT TGTAACATTC TTAAAGGTTT TTTAATTAAA	3840
45	TCGTACATTC CTtCGTCAAA TCCCAATTTA TGCAATGCTT CTTTAATAAT TCCTTGAGTA	3900
	GAAGTTACTA AATTATTGTT CTCAGTCATG ATCCTTTTCG CCTCTTCTTT ACCTAATGAT	3960
50	TTCGCTTTCA AACATATTGT AACATAACGT ATTCTTTTTT AAAGCCCTTA CAAACTGATT	4020
	GTTACAACCTT TTTGACATTA TTGAAATACA TGTCTTATTT TTTCAAGTGC AAGGTCCAAT	4080
55	TCTTCTTTAG TAATAATTAA TGGTGGTGCA AAACGAATGA CAGTATCATG CGTTTCTTTA	4140

EP 0 786 519 A2

ACACCTATAA ACAAACCACG TCCACGGACT TCTTTAATTG ATGGATGATC AATTGCTTT 4260
AATTGTTCTT TAAAATAATC TCCTAATTCT AAAGAGCGGC CTGGTAAATC CTCATCAACG 4320
5 ATAACATCTA ATGCAGCAAT TGATGCAGCA CAAGCAAGTG GATTACCACC AAATGTTGAA 4380
CCATGTGAGC CAGGTGTAAA GACATCTAAT ACTTCTTTAT CTGCTAATAC AACAGAAATT 4440
GGGAAGACTC CACCACCTAG TGCTTTACCT AAAATATAGA CATCAGGTTT TACATTATCC 4500
10 CAATCCGTAG CAAATAATTT ACCCGAACGA CCTAATCCTG CTTGGATTTC GTCAGCAATA 4560
AATAAGACAT TATGTTTCATC ACATAATTCT CTAATTGCTT TCAAATATCC TTCTGGCGGT 4620
ATATTTATAC CCGCTTCACC TTGAATTGGT TCTACTAAAA CTGCTGCAGT ATTTTCATTA 4680
15 ATTGCAGCTT TCAATGCATC TACATCTCCA AAATCAACTT TTCTAAATCC ATCTAATAAC 4740
GGACCATAAC CACGTGGTA TTCTGCTTCT GAAGATAATG AAATGGCGC CATTGTTTGA 4800
20 CCATGGAAGT TACCATTAAA TGCAATGATT TCTGCTTTAT TTGGCTCAAT TCCTTTAACA 4860
TCGTATGCC AGCGTCGTGC TGCTTTCAA GCTGTTTCTA CTGCTTCAGC ACCTGTATTC 4920
ATTGTTAAAG CTTTATCTTT ACCTGCCAGT TTACAAATTT TTTCGTACCA TTCACCTAAG 4980
25 TTATCACTAT GAAAAGCACG TGAACTAAA GTCACCTTAT CAGCTTGATC TTTAATGCT 5040
TGAATAATTT TCGGATGTCT ATGACCTTGG TTAACAGCGG AATATGCAGA TAACATATCC 5100
ATATATTTAT TGCCTTCAGG ATCTTTAACC CATACCCCTT CAGCTTcTGa AATGaCAATT 5160
30 GGcAATGGTA AATAATTATG TGCTCCGTAA TGATTTGTTA ACTCAATAAT TTTTTCAGAT 5220
TTAGTCATCA TATCTCCCCT TTTCATCATT TATAACTATT ATACATGAAA CATTATCCAA 5280
ATAATTACAT TAGTTTTCAA AGCAGATACT TTTCCACCAA AAAAGATGAA ATAATCACTA 5340
35 AGTTTCATTA AATTGTCTA TTTGAAAAC CCTTACATTT ATAATGACAT AATTACTTAA 5400
ATGaTTACAA GCAAAGAAT TGATAATTTT ACACCTAATC AAAAGTATAT TTTACTAAGA 5460
ATATTTTTAT TTATAAATAT TGAAAACCAC TAACAAATTG CATACACAAT ATCATTAGTG 5520
40 GTAACAGTTA AACACTTATT TATCTTTACG GGGTAATGGG TTAAAACCCT TnCATTAAAA 5580
TTGGATGnCC ATAAAATTAG GG 5602

45 (2) INFORMATION FOR SEQ ID NO: 130:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 5924 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

55

EP 0 786 519 A2

	TAACCCCATTTTACCTGGAA AAATCgTTTG CGATGCaATm GCaTTtGaAT ATaAATACAT	60
	TTTACGTATa GAATTATAAA AgGTTTCATT CaAATCTTAG GGTCAAAAAT GTTATAATAT	120
5	TTTTATGTCA AATTTAAAAC AGTAACACTT ATTTACAAGG TTGCAATATT TTGAAGTAAT	180
	AAAGGAAGTG TCGCGTATTT TAACTTTTTTC AGAGCAAAAT GCACTCGCGA AAATAGATGA	240
10	TTTAATGAAT ACTTATTGCA ATCAATGTCC AATCAAACT CGTCTGCGTA AATTAGAGGG	300
	GAAAACGAAG GCGCATCATT TTTGTATCAA TGAGTGTTCA ATAGGGAAAG AAATAAAACA	360
	ATTAGGAAAT GAACTTCAAT AGGAGGAAGT CAAATGAAAA TTATATCTAT ATCAGAAACA	420
15	CCGAACCACA ACACAATGAA GATTACACTT AGTGAAAGCA GAGAAGGTAT GACATCAGAT	480
	ACGTATACTA AAGTTGATGA TTCACAGCCA GCATTTATTA ATGACATCTT AAAGGTTGAA	540
	GGCGTTAAAT CAATTTTCCA TGTATGGAC TTTATTTTCA TAGATAAAGA AAATGACGCA	600
20	AATTGGGAAA CAGTATTGCC AAAAGTAGAG GCTGTATTCG AATAAATTTT TCATCAACTA	660
	GTATTCGGGG GGAATAAAGT ATATGGAAAT TTTACGTATA GAGCCAACAC CAAGTCCAAA	720
	TACAATGAAA GTTGTTTTGT CATATACAAG AGAAGACAAG TTATCTAATA CTTATAAAAA	780
25	AGTAGAAGAA ACACAACCAA GATTTATAAA TCAGTTGTTA TCTATAGATG GTATCACTTC	840
	CATTTTTTCAT GTCATGAACT TCTTAGCTGT TGATAAGGCA CCAAAGCTG ATTGGGAAGT	900
	CATATTACCT GATATTAAAG CTGCTTTTTTC TGATGCGAAT AAGGTTTTAG AATCTGTAAA	960
30	TGAACCTCAA ATTGACAATC ATTTTGGTGA AATTAAAGCT GAATTATTAA CTTTAAAGGG	1020
	TATACCGTAT CAAATTAAGC TAACTTCTGC TGACCAAGAA TTAAGAGAAC AATTACCACA	1080
35	AACATATGTT GACCATATGA CTCAAGCGCA AACAGCACAT GACAATATTG TTTTATGCG	1140
	TAAATGGCTA GATTTAGGAA ATCGCTATGG AAATATTCAA GAAGTAATGG ATGGTGTCTT	1200
	AGAAGGAAGTG CTAGCTACCT ATCCAGAATC ACAGTTACCC GTATTGGTAA AACATGCTTT	1260
40	AGAAGAAAAT CACGCAACTA ATAATTATCA TTTCTATCGA CATGTCTCTT TGGATGAATA	1320
	TCATGCAACT GATAATTGGA AGACTCGATT ACGAATGTTA AACCATTTTC CAAAGCCGAC	1380
	TTTTGAAGAT ATACCGCTGC TTGATTTAGC TTTATCTGAT GAAAAAGTAC CGGTTAGACG	1440
45	TCAAGCGATT GTATTATTAG GTATGATTGA AAGTAAAGAA ATTTTACCGT ATTTATATAA	1500
	GGGGCTTCGT GATAAAAGTC CTGCTGTAAG AAGAACAGCA GGGGATTGCA TAAGCGATTT	1560
	AGGGTATCCA GAGGCACTAC CAGAAATGGT GCTACTATTA GATGATCCAC AGAAAAATCGT	1620
50	TAGGTGGCGT GCTGCTATGT TTATCTTTGA TGAAGGTAAT GCAGAGCAGC TTCCCGCACT	1680
	AAAAGCCCAT ATTAATGACA ATGCGTTTGA AGTTAAATTA CAAATTGAAA TGGCCATATC	1740

55

EP 0 786 519 A2

	AATTTAATTG GAGGAATTAA ATATGAATGC ATATGATGCT TATATGAAAG AAATTGCGCA	1860
	ACAAATGCGT GCGGAATTAA CTCAAAATGG TTTTACAAGT TTAGAAACGA GCGAACAGct	1920
5	ATCGGAGTAT ATGAACCAAG TAAATGCTGA TGACACTACT TTTGTAGTTA TTAACCTCTAC	1980
	ATGCGGCTGT GCAGCTGGAT TAGCAAGACC AGCTGCAGTA GCAGTTGCAA CACAAAATGA	2040
10	ACATAGACCT ACAAATACAG TTACAGTTTT TGCTGGGCAA GATAAAGAAG CAACTGCTAC	2100
	AATGCGAGAA TTCATTCAGC AAGCACCATC TAGTCCTTCG TATGCTTTAT TCAAAGGTCA	2160
	AGATTTAGTT TATTTTATGC CTAGAGAATT TATCGAAGGT AGAGATATTA ATGACATTGC	2220
15	AATGGACTTA AAGGATGCCT TTGACGAAAA TTGTAAATAG TACACATAAA TAAATATAAA	2280
	GGTTAACACA TTTTATAATA TTA AAAATGG TGTCTGTCAT TGAAAATAGA GAATATAGTT	2340
	GTATTCTATT TGTTAAATAA AGTCCGTTTT TACCaaCTAT ATTTTCTAGA AATTTAACTG	2400
20	TTTTAATAGG ACATCAAACA TAATATTCaa ATCaTGTGTT AACCTCTTTT TTA AAAATTTT	2460
	TTAGCATTAA AGTTATAGAT TTGGGTAAAC AATTACCAAT TGGAAACATA TATCACGTTA	2520
	CGATGGGGTA GGTACTTAAT CAGCATTTTA TAAATAAAGT AACGGAATTC ATGATATTAA	2580
25	TATCATATTC CTAAAATGAG TGATAACAAA ATGCTACATA AAGTTAAGTT ATATCAAACCT	2640
	AAATATACAT ACTATAAATA ATGAAAATGA GGTGTTATCG CATATGTTGA ATTCATTTGA	2700
	TGCAGCATAT CACAGTCTTT GTGAAGAAGT TTTAGAAATA GGAAATACAC GAAATGATCG	2760
30	CACAAATACA GGTACGATTT CGAAATTTGG TCATCAACTT CGCTTTGACT TATCTAAAGG	2820
	ATTTCCACTA TTAACGACAA AGAAAGTTTC TTTTAAATTA GTAGCAACCG AATTATTATG	2880
35	GTTCAATAAA GGAGATACAA ACATCCAATA CTTATTAAAA TATAATAATA ATATATGGAA	2940
	CGAATGGGCT TTTGAAAATT ATATCAAATC AGACGAGTAT AAAGGTCCAG ATATGACAGA	3000
	TTTCGGGCAT CGTGCAATTGA GTGATCCTGA ATTTAACGAA CAATATAAAG AACAAATGAA	3060
40	ACAATTTAAG CAACGTATTC TTGAAGATGA TACATTTGCG AAGCAATTCG GGGATTTAGG	3120
	AAATGTTTAT GGTAAACAAT GGCGAGATTG GGTGATAAAA GATGGTAATC ATTTTGATCA	3180
	ACTTAAACA GTAATTGAAC AAATTAAGCA TAATCCAGAT TCAAGGCGAC ACATCGTATC	3240
45	TGCATGGAAT CCAACAGAAA TTGATACAAT GGCACCTCCG CCTTGTCATA CCATGTTCCA	3300
	GTTTTATGTC CAAGATGGTA AGTTAAGTTG CCAGTTATAC CAACGTAGCG CAGATATCTT	3360
50	TTTAGGTGTG CCATTTAATA TCcGCagctA CGCTTTATTG ACACACCTTA TTGCCAAAGA	3420
	ATGTGGACTT GAAGTGGGTG AATTTGTGCA TACATTTGGA GATGCACATA TTTATTCAAA	3480
55	TCATATTGAT GCGATTCAAA CACAATTAGC ACGTGAAAGC TTCAATCCTC CAACATTAAA	3540

	TGAATCACAT CCAGCAATAA AAGCTCCAAT AGCAGTGTAG TCATTGCATA GTTAGCTAAC	3660
	CATATAGACA TCAAAATGAC ATCATAGTAT TTTCAAGTGC AAAAAAGTAC TTTTTTGTGT	3720
5	TAAACGTTTT CATAAATTAT GCAAATCAT TATTTCTATC ACACTTTATG ATAAAAATTG	3780
	TGTTAAATTA AAGATAACTT AGTAATAAAA AATGAAATGA TAGAAGAAGG AGGATAATTA	3840
	TGACTTTATC CATTCTAGTt GCACATGACT TGCAACGAGT AATTGGTTTTt GAAAATCAAT	3900
10	TACCTTGGcA CCTACCAAAT GATTTGAAGC ATGTTAAAAA ATTATCAACA GGTCATACTT	3960
	TAGTAATGGG TCGTAAGACA TTTGAATCGA TTGGTAAACC ACTACCGAAT CGTCGAAATG	4020
15	TTGTACTTAC TTCAGATACA AGTTTCAACG TAGAnGGCGT TGATGTAATT CACTCTATTG	4080
	AAGATATTTA CCAACTACCG GGCCATGTTT TCATATTTGG AGGGCAAACA TTATTTGAAG	4140
	AAATGATTGA TAAAGTGGAC GACATGTATA TTACTGTTAT TGAAGGTAAA TTCCGTGGTG	4200
20	ATACGTTCTT TCCACCTTAT mCATTkGAgx CTGGGAAGTT GCCTCTTCAG TTGAAGGTAA	4260
	ACTAGATGAG AAAAATACAA TTCCACATAC CTTTCTACAT TTAATTCGTA AAAAAATAAGG	4320
	GGGAAAACGA CCATGACAAA ACAGATTATA GTAACAGACT CAACATCCGA TTTATCTAAA	4380
25	GAATACTTAG AAGCAAACAA CATTATGTA ATTCTTTTAA GTTAACTAT TGAAGGAGCT	4440
	TCATACGTTG ACCAAGTAGA TATTACATCA GAAGAATTTA TTAATCATAT TGAAAATGAT	4500
	GAAGATGTAA AGACAAGTCA GCCAGCCATA GGTGAATTTA TATCTGCTTA TGAAGAACTA	4560
30	GGAAAAGATG GCTCTGAAAT CATAAGTATT CATCTTTCTT CAGGATTAAG TGGTACATAT	4620
	AACACTGCTT ACCAAGCAAG TCAAATGGTA GATGCTAATG TAACTGTTAT TGATTCAAAA	4680
35	TCTATTTCTT TTGGTTTAGG GTATCAAATA CAACACCTAG TAGAGCTTGT AAAAgAaGGT	4740
	GtCTCAACTT CTGAAATAGT TAAAAAGTTA AATCATTTAA GAGAAAACAT TAAATTATTT	4800
	GTAGTTATAG GGCAATTGAA TCAATTAATT AAAGGTGGCA GAATTAGTAA AACAAAAGGT	4860
40	TTGATTGGTA ATCTTATGAA AATTAAACCA ATTGGTACAC TAGATGATGG TCGCTTAGAG	4920
	CTTGTGcmCA ATGCGAGAAC TCaAAATTck AGTATCCAAT ACTTGAAAAA GGAAATTGCT	4980
	GAATTTATAG GAGATCATGA AATCAAATCC ATTGGTGTG CACATGCTAA CGTCATTGAA	5040
45	TATGTTGATA AATTGAAGAA AGTTTTTAAT GAAGCTTTTC ATGTGAATAA TTACGATATA	5100
	AATGTAACTA CACCAGTTAT TTCTGCACAT ACTGGTCAAG GTGCGATTGG CCTCGTAGTC	5160
	CTTAAGAAGT AAATTTAATC TTTTCAGTGT TAATTACTTC CATTTCAATC CTTTATAGAC	5220
50	TAAATTTATA ATTAGATAGA TAGAGGAGGT AATTCATATG ACAAAGAAT ATGCAACATT	5280
	AGCAGGAGGA TGTTTCTGGT GCATGGTTAA ACCATTTACA TCATATCCAG GCATCAAGTC	5340
55		

GAATCAAACC GGCCATGTCG AAGCAGTACA AATTACGTTT GATCCAGAGG TTA CTTCTT 5460
 TGAAAATATA TTAGACATAT ATTTCAAAC ATTTGACCCA ACTGATGATC AAGGGCAATT 5520
 5 TTTCGATAGA GGCGAAAGCT ATCAACCACT CATTCTCTAT CATGATGAAC ATCAGAAAAA 5580
 GGCTGCTGAG TTAAAAAGC AACAATTAAA TGAACAAGGT ATTTTCAAGA AACCAGTGAT 5640
 10 TACACCTATT AAACCATATA AAAATTTCTA TCCAGCTGAA GACTACCATC AAGATTATTA 5700
 CAAAAAGAAC CCGGTACATT ATTACCAATA TCAACGTGGT TCAGGTAGAA AAGCGTTTAT 5760
 AGAATCATAT TGGGGGAATC AAAATGCTTA AAAAAGATAA AAGTGAATA ACAGATATAG 5820
 15 AATATATTGT TACACAAGAA AACGGCACTG AACCACCATT TATGAATGAA TATTGGAATC 5880
 ATTTTGCTAA AGGATTTATG TAGATAAAAT TCnGGTAAAC CTTG 5924

(2) INFORMATION FOR SEQ ID NO: 131:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 9280 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 131:

GGCCGTTnAA AATCTCCAAA ATAnAAAAAC CCATCTTGTT CCAATGTTTT AAAATCGCCa 60
 30 TCCaACACTT GaTCaATAGC TTGCAACAAC GTTGAACGTG TTTTaCCAAA AGCATCaAAC 120
 GCTCCCACTA AAATCAGTGC TTCAAGTAAC TTTCTCGTTT TGACTCTCTT CGGTATACGT 180
 35 CTAGCAAAAT CAAAGAAATC TTAAATTTG CCGTTCTGAT AACGTTTCATC AACAATCACT 240
 TTCACACTTT GATAACCAAC ACCTTTAATT GTACCAATTG ATAAATAAAT GCCTTCTTGG 300
 GAAGGTTTAT AAAACCAATG ACTTTCGTTA ATGTTTCGGTG GCAATATAGT GATACCTTGT 360
 40 TTTTTTGCTT CTTCATCAT TTGAGCAGTT TTCTTCTCAC TTCCAATAAC ATTACTTAAA 420
 ATATTTGCGT AAAAATAATT TGGATAATGG ACTTTTAAAA AGCTCATAAT GTATGCAATT 480
 TTAGAATAGC TGACAGCATG TGCTCTAGGA AAACCATAAT CAGCAAATTT CAGAATCAAA 540
 45 TCAAATATTT GCTTACTAAT GTCTTCGTGA TAACCATTTT GCTTTGCACC TTCTATAAAA 600
 TGTGACGCT CACTTTCAAG AACAGCTCTA TTTTTTTTAC TCATTGCTCT TCTTAAAATA 660
 TCCGCTTCAC CATAACTGAA GTTTGCAAAT GTGCTCGCTA TTTGCATAAT TTGCTCTTGA 720
 50 TAAATAATAA CACCGTAAGT ATTTTTTAAT ATAGGTTCTA AATGCGGATG TAAATATTGA 780
 ACTTTGCTTG GATCATGTCT TCTTGAATG TAAGTTGGAA TTTCTTCCAT TGGACCTGGT 840

EP 0 786 519 A2

	ACACTTCTTA CACCGTCAGA CTCTAATTGG AATATGCCAG TCGTATCTCC TTGCGACAAC	960
	AATTCAAACA CTTTTTGATC ATCAAACGGA ATCTTTTCGA TATCAATATT AATACCTAAA	1020
5	TCTTTTTTGA CTGTGTGTTAA GATTTGATGA ATAATCGATA AGTTTCTCAA CCCTAGAAAA	1080
	TCTATTTTTA ATAACCCAAT ACGTTCGGCT TCAGTCATTG TCCATTGCGT TAATAATCCT	1140
	GTATCCCCTT TCGTTAAAGG GGCATATTCA TATAATGGAT GGTCATTAAT AATAATTCCT	1200
10	GCCGCATGTG TAGATGTATG TCTTGGTAAA CCTTCTAACT TTTTACAAAT ACTGAACCAG	1260
	CGTTCATGTC GATGGTTTCG ATGTACAAAC TCTTTAAAT CGTCAATTG ATATGCTTCA	1320
	TCAAGTGTA TTTCTAATTT ATGTGGGATT AAACCTGAAA TTTCAATTAA TGTAACCTCA	1380
15	TCAAACCCCA TAATTCTTCC AACATCTCTA GCAACTGCTC TTGCAAGCAG ATGACCGAAA	1440
	GTCACAATTC CAGATACATG TAGCTCGCCA TATTTTTCTT GGACGTACTG AATGACCCTT	1500
	TCTCGGCGTG TATCTTCAAA GTCAATATCA ATATCAGGCA TTGTTACACG TTCTGGGTTT	1560
20	AAAAACGTT CAAATAATAG ATTGAATTTA ATAGGATCAA TCGTTGTAAT TCCCAATAAA	1620
	TAACTGACCA GTGAGCCAGC TGAAGAACCA CGACCAGGAC CTACCATCAC ATCATTGTT	1680
25	TTGCGATAAT GGATTAAATC ACTTACTATT AAGAAATAAT CTTCAAAACC CATATTAGTA	1740
	ATAACTTTAT ACTCATATTT CAATCGCTCT AAATAGACGT CATAATTAAG TTCTAATTTT	1800
	TTCAATTGTG TAACTAAGAC ACGCCACAAA TATTTTTTAG CTGATTCATC ATTAGGTGTC	1860
30	TCATATTGAG GAAGTAGAGA TTGATGATAT TTTAATTCTG CATCACACTT TTGAGCTATA	1920
	ACATCAACCT GCGTTAAATA TTCTTGGTTA ATATCTAATT GATTAATTTT CTTTTAGTT	1980
	AAAAAATGTG CACCAAAATC TTCTTGATCA TGAATTAAGT CTAATTTTGT ATTGTCTCTA	2040
35	ATAGCTGCTA ATGCAGAAAT CGTATCGGCA TCTTGACGTG TTTGGTAACA AACATTTTGA	2100
	ATCQAAACAT GTTTTCTACC TTGAATCGAA ATACTAAGGT GGTCCATATA TGTGTCATTA	2160
	TGGGTTTCAA ACACTTGATC AATATCACGA TGTGATCAC CGACTTTTTT AAAAATGATA	2220
40	ATCATATTGT TAGAAAATCG TTTTAATAAT TCAAACGACA CATGTTCTAA TGCATTCATT	2280
	TTTATTTCCG ATGATAGTTG ATACAAATCT TTTAATCCAT CATTATTTTT AGCTAGAACA	2340
45	ACTGTTTCGA CTGTATTTAA TCCATTGTC ACATATATTG TCATACCAA AATCGGTTTA	2400
	ATGTTATTTG CTATACATGC ATCATAAAAT TTAGGAAAAC CATACAATAC ATTGGTGTCA	2460
	GTTATGGCAA GTGCATCAAC ATTTTCAGAC ACAGCAAGTC TTACgGCATC TTCTATTTTT	2520
50	AAGCTTGAAT TTAACAAATC ATAAGCCGTA TGAATATTTA AATATGCCAC CATGATTGAA	2580
	TGCCCCCTTT CTATTAGTTA AGTTTGTGTC GTAAAGCTGT AGCAAGTTGC TCAAATTCAT	2640

55

	CAATATCATT AATAATCAAT TGCCCTTTAG AACGTAATCG ACATCTGATT TCATTACCTT	2760
	CATCGACTGC AAATACCCAT ATTTTCAAGC CTTTGATGTC AGCAATTGTA TTAACAAACT	2820
5	GAGATGCTTC ATTTGGCTGA ATACCGAATT GCTCCAATAC ATCTTCAGTT ATTTTAACTT	2880
	GGCAGAATCC ATCATCCATA AGTTCGAAAT GTTGTA AAC ATAACCTTGA AACGGCAACA	2940
	TTTTTGGGTC CTTCTCCATC ATTTTATTTA AAAGCGCATT ATGATCAATA TCATGCCCAA	3000
10	TTAACTTTCC AGCAATTTCC ATAGTATGTT CTGAGGTATT GTTAAAAAGG AATCGCCCAG	3060
	TATCACCGAC GATACCAAGA TATAAACGC TCGCGATATC TTTATTAAACA ATTGCTTCAT	3120
15	CATTAAAATG TGAGATTAAA TCGTAAATGA TTCACTTGT AGATGACGCG TTCGTATTAA	3180
	CTAAATTAAT ATCACCATAC TGATCAACTG CAGGATGATG ATCTATTTTA ATAAGTTTAC	3240
	GACCTGTACT ATAACGTTCA TCGTCAATTC GTGGAGCATT GGCAGTATCA CATACAATTA	3300
20	CAAGCGCATC TTGATATGTT TTATCATCAA TGTATCTAA CTCTCCAATA AACTTAATG	3360
	ATGATTCCGC TTCACCCACT GCAAATACTT GCTTTTGCGG AAATTTCTGC TGAATATAGT	3420
	ATTTTAAACC AAGTTGTGAA CCATATGCAT CAGGATCTGG TCTAACATGT CTGTGTATAA	3480
25	TAATTGTATC GTTGTCTTCG ATACATTTCA TAATTTTCAAT CAAAGTACTA ATCATTTTCA	3540
	TACTCCCTTT TTTAGAAAAG TTGCTTAATT TAAGCATTAG TCTATATCAA AATATCTAAA	3600
	TTATAAAAAT TGTTACTACC ATATTAACT ATTTGCCCGT TTTAATTATT TAGATATATA	3660
30	TATTTTTCATA CTATTTAGTT CAGGGGCCCC AACACAGAGA AATTGGACCC CTAATTTCTA	3720
	CAAACAATGC AAGTTGGGGT GGGGCCCCAA CGTTTGTGCG AAATCTATCT TATGCCTATT	3780
	TTCTCTGCTA AGTTCCTATA CTTCTGCAAA CATTTGGCAT ATCACGAGAG CGCTCGCTAC	3840
35	TTTGTCTGTT TGAATATGCA TGTTCACTTC TATTTTGCGG AAGTTTCTTC CGACGTCTAG	3900
	TATGCCAAAG CGCACTGTTA TATGTGATTC AATAGGTACT GTTTTAATAT ACACGATATT	3960
40	TAAGTTCTCT ATCATGACAT TACCTTTTTT AAATTTACGC ATTTTCATATT GTATTGTTTC	4020
	TTCTATAATA CTTACAAATG CCGCTTTACT TACTGTCCG TAATGATTGA TTAAGTGG	4080
	TGAAACTTCT ACTGTAATTC CATCTTGATT CATTGTTATA TATTTGGCGA TTTGATCGTT	4140
45	AATTGTTTCA CCCATCTGAG GCTGTCTTCC TAAAAGTTGC ATAGACTTTA AAACATCTTG	4200
	TCTATTAATC ACACCCACTG TCTTTTTATT ACTCGAAACG ACAGGAATCA ATTCAATACC	4260
	TTCCCAAATC ATCATATGCG CACAACCTGC TACTGTACTC ATAGCATTTA CATAAATAGG	4320
50	ATTTGCGGTC ATCACTTTAT CTATTTGTC GTCGTCCTTT GTATTAATCA TCTCTCGACT	4380
	TGTTACAATA CCTACTAATT TATACGACTC ATTGACTACC GGAAATCTTG TATGGCCAGT	4440

55

EP 0 786 519 A2

ATCTAATGGC GTCATTATAT CTTGAACTAT TAAGATATCT TTTCGTATTT TCTGATTAAA 4560
 AAGTGCTTTG TTGATAATAT TTGCAACTAG GAATGTATCA TAACTTGATG ATAGAACAGG 4620
 5 TAAATCATGT TCATTCGCAA AATTAATAAC TTTATTAGAT GGCTTAAATC CACCAGTAAT 4680
 TAATATAGCC GTACCTCTTT TTAAGCTTC AATCTGCACA TCTTCACGAT TTCCGACAA 4740
 CAATAATGTC TTGGACCAA TATACTTTAA AATATCTTTG AGTTCCATTG CTCCAATTGC 4800
 10 AAATTAGAT ACCATCTTAG TGATACCTTT GTTGCCACCT AACACTTGGC CATCAATAAT 4860
 ATTGACAATT TCATTAAGG TTAATGTTT AATTTTACATTA CGATTACGTT TTTCGATTTCG 4920
 AACCGTACCA ACACGATCTA TCGTTGCGAC CATGCCCATTT TTATCAGCAT CTTTmATTGc 4980
 15 ACGATATGCT GTCCCyCtCaG ATACGTTTAA AAATTTAGCG ATTTTACGCA CCGAAATTTT 5040
 AGAGCCTATA GATAACGATT CAATATAATC TAAATTTTGT TCATGTTTTG TCATTCTTTA 5100
 CCTCTCTTT TCGAACAGTA TTAACATACAT TATAACTTTA TTTTGGATAA AAAGCATTGA 5160
 20 AGTGAAATGA AATAATGATC GTTtCACCTA TTTTATTTTT TGAAATATA CAACAAACAC 5220
 AAAGATCACA AAATCTTTAA TTTTAAATGG AAAAATCCAT TATTATTTAT TAGAATGTAA 5280
 GTGAGGAGGG ATGTACTAAT GTATAAAAAT ATATTACTTG GTGTAGACAC TCAGTTAAAA 5340
 25 AATGAAAAAG CACTAAAAGA AGTGTCTAAA TTAGCTGGCG AAGGTACAGT CGTAACAGTT 5400
 TTAACGCAA TCAGCGAACA AGaTGCTCAA GCATCAATTA AAGCAGGTGT TCATTTAAAC 5460
 30 AAACCTACTG AAGAACGAAG CAAGCGATTG GAAAAAACAC GCAAAGCTTT AGAAGATTAT 5520
 GGTATTGATT ATGACCAAAT AATTGTTTCGT GGTAATGCAA AAGAAGAACT ATTAACAAAT 5580
 GCTAATAGCG GTAAATATGA AATTGTTGTT TTAAGTAACC GTAAAGCAGA AGACAAAAAG 5640
 35 AAATTTGTAC TTGGAAGTGT CAGCCACAAA GTAGCAAAAC GTGCGACTAT CCCTGTATTA 5700
 ATCGTTAAAT AAAATTTTAA TCCAGAATCA CAAATAATCT TTCAATCATG ATGCAGTCTC 5760
 AAACGACTGA GTAAATACAA GAAACGATTA TGAATGTGGT TCTGGATTTT TTATATCGTA 5820
 40 GTAAATTTAT AATCAATGTC TAATTGTATA AACTTAAAT TACGAGAGTA GGTCAGAAAT 5880
 GATAAAGAAC CACTGATGTC CCCCCTCCAC GTCGTAACCTG AATCAGTAGA ATATAAAAAAC 5940
 ACCCACTAAA AATATGCAGA CGATAACTTC CACATAGATT AGCGAGGTGT TTTTGTAGTT 6000
 45 AAAATCTATA TTCTATTTAA AACTGAACAG ATTCACCTGG TTTTAAATTT TGCACGTCCC 6060
 CTACATTAAAC AGCATCTTTA AATTGTTGTG GATCTTGTTT GATTAATGGG AATGTATCAT 6120
 50 AATGAATCGG TACAGAAATT TTTGGTTTAA TAAATTCATT AATAGCATAA CTTGCATCAT 6180
 CAATACCCAT CGTAAATTA TCTCCAATTG GTACAAAACA TACATCAACT GGATGACGTT 6240

55

EP 0 786 519 A2

	TTCAACTTCA AACACGATAC CCATTGGCAT ACCTAAATAA ACTGGgAATA CCATTTTCAT	6360
	GTGTAAAACT TGAACATGA AATGCTTGAA CAAATTTAAC GCTTCCGAAA TCAAAgTTTG	6420
5	CTTTACCACC AaTATTCATA CCATGAACAT TTTCAACACC GTGATATGAA GAAAGATAGT	6480
	CAGCCATTTT TGCACCTCCA ATTACTGTTG CTCCTGTTTT CTTTGCTAGT TCCACAACAT	6540
	CACCAAAATG ATCAAAATGA CCGTGCGTTA AAACGATATA GTCTACCTGC ACTGTTTCAA	6600
10	TATTCAAATC ACACTTAGGG TTATTTGAAA TAAACGGATC TACGATAACC TTTTGTGTGT	6660
	TCCCTTCTAA ATAAATCGTT GATTGACCAT GAAATGATAA CTTCATTTGA GCATCCTCCT	6720
	ATCAATTACT ATATAAATTT AGTACCCTTT TGCCACTTAA TTATAACAAA TTCTCAAATT	6780
15	TTAAAAATTG AAAATCTAGT TAATGTATTA GCTCGATTTT GAAATCTAAT AATAATTGGC	6840
	ATAAAATGGA AGTAATATTA TGTGAGGAG TGTTTATAAA ATGACAAAAA TATCAAAAAT	6900
20	AATAGACGAA TTGAACAATC AACAAGCTGA TGCAGCATGG ATTACAACAC CGTTGAATGT	6960
	ATATTATTTT ACTGGATACC GTAGCGAACC CCATGAAAGA TTATTTGCAT TATTGATTAA	7020
	GAAAGATGGT AAACAAGTAC TATTTTGTCC AAAAATGGAA GTCGAAGAAG TCAAAGCATC	7080
25	ACCTTTCACA GGTGAAATCG TTGGATATTT AGACACTGAA AACCCTTTTT CACTTTATCC	7140
	TCAAACAATC AATAAATTAC TAATTGAAAG CGAGCACTTA ACAGTAGCAC GCCAAAAACA	7200
	ATTAATCTCT GGTTCATG TCAATTCATT CGGAGATGTT GATTTAACAA TCAAACAATT	7260
30	GAGAAATATT AAATCCGAAG ATGAAATTAG CAAAATACGT AAAGCTGCTG AGTTAGCAGA	7320
	TAAGTGTATC GAAATAGGTG TTTCTTATTT AAAAGAAGGT GTGACTGAAT GTGAAGTAGT	7380
	CAACCATATT GAGCAAATA TCAAACAATA TGGCGTCAAT GAAATGAGTT TTGATACGAT	7440
35	GGTTTTATTT GGAGATCATG CCGCATCACC TCATGGCACA CCAGGAGATC GCAGATTAAA	7500
	AAGCAATGAA TATGTACTAT TTGATTTAGG TGTAATTTAT GAGCATTATT GTAGCGATAT	7560
40	GACACGTAAT ATTAAATTTG GTGAACCTAG CAAAGAAGCA CAAGAAATTT ATAATATTGT	7620
	ATTAGAAGCA GAAACATCTG CAATCCAAGC AATTAAACCT GGAATACCAT TAAAAGATAT	7680
	CGATCATATC GCTAGAAATA TTATTTGAGA AAAAGGTTAT GGTGAATATT TCCCTCATCG	7740
45	CTTAGGTCAT GGCCTAGGAT TACAAGAACA TGAATATCAA GATGTTTCAA GTACTAATTC	7800
	TAATTTGTTA GAAGCTGGCA TGGTTATTAC AATCGAACCA GGTATTTATG TACCTGGTGT	7860
	TGCAGGTGTA ACAATTGAAG ATGACATACT TGCTACTAAT GAAGGATATG AAGTATTAAC	7920
50	ACATTACGAA AAATAAGGAG TGGGATAAAA ATGAAAAGCT TGTTACAAGC GCATTCTCAT	7980
	TCAGTCAAAC ACTGCCAATA TAACATTGTA GCGCCTAAGA CATAAATTTT TATCCAAGTC	8040

55

5 TGTAATGAAT CAAATCAATA TCATTCATGT TCGATGATTT CTTCGCATTG TTTCTAGCTT 8160
 TAATTTATCA TTATTTAATT TTAATAACCA AGGAGATGAT AACGTCATTG TTTAGTACGC 8220
 10 TGTAATCCAT TCCCTTTTCA TCAAATTCAA ATTATAATTG TAATGCTTCT TCTACAGATT 8280
 TATATTCCAT TTCAAATGCC TCTGCAACGC CTTTATTGGT TACGTGACCT TTGTAAGTAT 8340
 TTAAACCTAA TGATAATGGT TGATTTGATT TAAATGCTTC TCTATACCCT TTATTAGCTA 8400
 15 GCATGAGCGC ATAAGGTAGC GTAgCATTAT TTAAAGCTAA CGTCGAAGTA CGCGGTACTG 8460
 CACCTGGCAT ATTTGCAACT GCATAATGAA CCACACCATG CTTAATATAT GTAGGATCAT 8520
 CATGTGTCGT AATTTTATCA GTTGTtTCAA AAATACCGCC TTGATCAATA GCAATGTCAA 8580
 20 TAATAACTGA CCCATTTTTT ATTTGTTTAA TCATGTCTTC TGTTACAAGT CTTGGCGCTT 8640
 TAGCACCTGG AATTAAAACT GCACCTATTA CTAAATCACT TTGTTTAACTA TACAACTCAA 8700
 TATTCAACGG ATTTGACATA ATTGTATGTA CACGTCCACC GAATAAATCA TCTAATTGTT 8760
 GTAAACGCTT TGGATTAACA TCTAAAATCG TAACATCTGC ACCTAGTCCT AGTGCAATTT 8820
 TAGCTGCATT TGTTCCTGCT TGACCACCAC CGATAATAGT TACTTTACCC TTAGGTACTC 8880
 25 CTGGGACACC ACCTAGTAGA ATTCCCATAC CACCATTAAAG TTTTGTAGG AACTCTGCGC 8940
 CAACTTGAGC TGACATTCTT CCTGCTACCT CACTCATTGG TGATAACAAT GGTAAAGATC 9000
 GGTCTGGTAA CTGCACAGTC TCATATGCAA TACTAATTAC TTTTCTATCT ATCAAAGCTT 9060
 30 GTGTTAATTT TTCTTCATTT GCTAAATGAa gatAaGTGAA TAATAACAAGC CCTTCTTTAA 9120
 AATATGGATA TTCAGATTCA AGTGGTTCTT TAACTTTAAT AACCATATCC ACATCCCCAA 9180
 CTTTGTCTTG TTCAGCAACA ATCTCAGCAC CTGCTTCTTT GTAATCTACA TCTTCAAAGA 9240
 35 ATGATCCTGA ACCCGcATTT GTTCCACTA AAACAGTATG 9280

(2) INFORMATION FOR SEQ ID NO: 132:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4669 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 132:

CTGATTAATC TCTTGTTGTC GTGTATTTAC TAATTGAATC GTTGGTGTCT GAACACGTCC 60
 CAGGGATAGC TGTGCATCAT ACTTTGTTGT TAGTGACGC GTTGCAATTA TCCCAACAAT 120
 CCAATCTGCC TCACTTCTCG CTAACGCTGC ATAATACAAA TCGTTATATT GACGACCGTC 180

EP 0 786 519 A2

	ACGGATTGGC TTTTGTAC CAACTTTATC CAAAATCAAT CTTGCAACTA GTTCACCTTC	300
	TCGTCCaGCA TCTGTTGCAA TAATAATATC TTTCACTTTA TTATCTAAAA TTAACGCTTT	360
5	TACTGTTTTA AATTGTTTGC TTGTTTTACC AATAACAACA GTTTTCATAT ATTTAGGTAT	420
	AATTGGAAGG TCTTCTAATC GCCATTCCCTT TAAATTTTAA TCGTATTGTT CAGGTGTCGC	480
	ATTTGTCACT AGATGACCTA ACGCCACGT GACAATATAT TGGTTATTTT CAAAGTAACC	540
10	ATTACGCTTC TGATTTATTT GTAAAGCATC AGCAATATCT CTTGCGACTG ATGGTTTTTC	600
	AGCTAATATT AAAGATTTCA TAAATTATCC TTTCTCATAC GTTCTTTTAT TTCGAACGTG	660
	CTTCATCTAT TCCACTAATC TTTGATTTAA ATTCAATGAT TGCAAATGAT GTGTTAAATG	720
15	TATTGTAACA TGTTAATATC ACTATTAACT TTCATTTTCA GTGAAATACT ATATAATAAA	780
	AGTAACAAAA AGTACGGAGG TAATGACATG AGCATAGTTC AGTTATATGA TATTACACAA	840
	ATAAAATCGT TCATTGAACA TTCGAATTAT GAATCAGCAT CATACTTATA TAAACTTCCT	900
20	CAACAGTACA ATGAAATAGA TGTATTAATA ACCGATGCGA TTGAATCACC TGGTGTATTT	960
	TCGATTAAAG AAAACGATTC AATCAAAGCA ATCATATTGT CTTTTGCATA CGATAAAAAAT	1020
25	AAATTCAAAG TCATAGGCCC TTTCTGGCT GACAATTATG TATTATCTGT CGATACGTTT	1080
	GAAACGCTAT TTAAAGCAAT GACTTCGAAC CAACCTGACG ATGCCGTCTT TAACTTTTCT	1140
	TTTGAAGAAG GCATTCAACA ATACAAACCA TTAATGAAAG TTATTCAAGC AAGTTATAAC	1200
30	TTCACTGACT ATTACATAGA AGCCCGTACA AGATTAGAAG AAGATATGCA CCAACCAAAT	1260
	ATCATTCTTT ATCACAAGG GTTTTATCGT GCTTTCAGCA AATTACACAC AACTACATTT	1320
	AAATATCAGG CACAGTCACC ACAAGATATC ATTGATAGTT TAGACGACCA TCATCATTTG	1380
35	TTTTTATTTG TTAGCGAAGG TTTACTTAAA GGTTATTTAT ACCTTGAAAT TGATTACAA	1440
	CAGTCAATCG CCGAGATTAA ATACTTCAGT TCTCATGTAG ATTACCGTTT GAAAGGTATC	1500
	GCTTTCGAGT TGCTTGCGTA TGCATTGCAA TATGCTTTTG ATAATTTTGA TATTAGAAAA	1560
40	GTATATTTTA AAATTCGTAA TAAAAATAAT AAATCATCG AACGATTTAA TGGTCTAGGT	1620
	TTCCATATCA ACTATGAGTA CATTAAATTC AAATTCGAAT CACGTAACGT AAAAGATCAA	1680
45	ACAATCCCTG AATAAACAC CAAGCAAATA CCCTACAGTA CATCATTAGC ATGTATTGTG	1740
	GGTTTTTCTA CTTTTTGTA ATATTGAAAA TTATAAGTAG TTGTTTTTAA CTATTAGGGC	1800
	AGAATGCTTT ACAATAACAT GCAAGTGTC ATTAAGGGGA GCACTGTCAT AAATAGTATA	1860
50	GGAGAGTGAG TAGTCTTGCA ATTTCTTGAT TTCTTAATCG CACTTTTACC TGCTTTATTC	1920
	TGGGGAAGTG TCGTTCTTAT TAATGTGTTT GTCGGCGGTG GACCTTACAA CCAAATTCGT	1980

55

EP 0 786 519 A2

	TTCAATAATC	CTACTGTAAT	TATTGTCCGGT	CTTATTTCTG	GTGCATTATG	GGCGTTTGGA	2160
	CAAGCGAATC	AGCTTAAATC	TATTAGTTTA	ATCGGTGTAT	CAAATACTAT	GCCAGTTTCT	2160
5	ACAGGTATGC	AATTAGTTGG	TACAACATTA	TTCAGCGTTA	TCTTTTTAGG	TGAATGGTCT	2220
	TCAATGACTC	AAATTATCTT	TGGTTTAATC	GCCATGATAT	TATTAGTTAC	TGGTGTAGCA	2280
	CTTACTTCAC	TTAAAGCTAA	AAATGAACGT	CAATCAGATA	ATCCTGAATT	TAAAAAAGCA	2340
10	ATGGGTATTT	TAATTGTATC	TACAGTTGGA	TATGTAGGTT	TCGTTGTACT	TGGTGACATC	2400
	TTTGGTGTG	GTGGAACGA	TGCATTGTTT	TTCCAATCTG	TCGGTATGGC	AATTGGTGGC	2460
	TTTATCCTAT	CCATGAATCA	TAAAACATCA	CTTAAATCAA	CAGCACTTAA	TCTATTGcCA	2520
15	GGTGTGATTT	GGGGAATTGG	TAACTTGTTT	ATGTTCTATT	CTCAACCAAA	AGTTGGTGTG	2580
	GCTACAAGTT	TCTCATTATC	ACAGTTACTT	GTTATCGTTT	CAACCTTAGG	CGGTATTTTC	2640
20	ATTTTAGGAG	AAAGAAAAGA	TCGTCGTCAG	ATGACGGGTA	TTTGGGCAGG	TATTATTATT	2700
	ATCGTGATAG	CTGCTATAAT	TCTAGGTAAT	TTGAAATAGA	AAGTTAAATA	CTCATGTAAC	2760
	GTAAAAATGT	AATCACTTCT	GAAAATAACC	ATTCACCTAT	AGAATGATTA	AAATTAATTT	2820
25	TCGGGAATTT	TACGTTGAAT	GTTCTCTAT	ATGTCCTAGG	AAATACGTGG	CTCTAAAAAC	2880
	AAAACGCAAT	AACACATCAT	GACATTAATC	ATGCGTTTTA	AGACTTTAAA	ATTAGCGATA	2940
	CTTTTAAAAT	CTTGATGATA	TTCATATATC	AAGTATGCGC	CATACATATG	AAGTGGATAG	3000
30	CTGCATAACG	CACTGCATTA	TCAACTTGAA	TGTATGAGTT	GAACAACTAT	GTCATAAATA	3060
	AAAGCCCCCT	TTTACAATA	TACATTTACA	TATTGTGGTA	AAGGGGGCTC	TCATTTTCTA	3120
	CGAATACTAA	AATGGATTTT	ATTTTCAAAT	GTGTAAACTA	GACAAACACT	GCCTGATACA	3180
35	CGTACAAAAT	AATGATACTA	ATAATGATTG	TCAAATTGGT	CGTCATACCT	ATAAATGGCA	3240
	GTGTTGATA	TTTAAACTGA	ATACCATAAG	AAATAATTGC	AACACcTACC	GGGAACATCC	3300
40	AAGTGACCAA	CAATGTCGTC	TTAATCATAT	CATCTGATAC	TGGTAACAAC	ACATATACTA	3360
	ACAATCCCGC	AACTAATGCT	AATCCATAAT	GCAAACATAA	ATATTTAATA	GTAGCAGGTA	3420
	TATACTTTCT	TTCCAGAGTA	AAATTCAACA	TGACACCTAG	CAAAATCATT	GATAACGGCA	3480
45	TATTTGCATG	GGAAAGTATG	CTAAAGAAAT	CGATTGCCAC	ATGTGGTAAA	TGGATGTGAC	3540
	TTATATTCAA	TATAACATT	ACAATGTATG	TAACGAGTGG	CACTGATTGT	AATAATTTCT	3600
	TACCTAAATA	TTTAAATCG	AATTGATCAC	TACCTTCACT	AAAGTAGCTA	CCTACAAAGT	3660
50	AAGTAATTCC	AAACATCACA	AAGGCACCAC	CTATATCAGC	CATAACAAAA	TAAATAAGTC	3720
	CCGTTTTAGG	CCATATCACT	TCAATTAGTG	GATATGCAAA	CAATCCAATA	TTCATAGCAC	3780

55

CAATCATTTT CGCCACAATA CCATATATAA TCATTAAAAT TGGTAAAATG GAGAATGACA 3900
 ATTTTAATTC TGCACTGTTT AAATTCACAA TAACTAAAGA TGGGAGTGTG ACATTAAGAA 3960
 5 CTAATGTAGC AATGACTTGA CTATCTGTTG CTTTATAAAA ATTAATGCGC TTCAAAAAGT 4020
 AACCAAGCGC AATTAATAAA ATAATCATAG TAAATTGTTT TGTCACTGTT ATCCCTTCTT 4080
 TCAATAATCT TCATAATTTA TAACTTTAAC ATACTCCACA GATATTTTAG AAGTCTACTG 4140
 10 TTTTCATGCTA TAATCTACAT TAAATGCACT TAATTATATT TCAAAGGAGT GTTATAGTAT 4200
 GTCTTTAGAA AACCAACTAG CCGAACTTAA ATATGATTAT GTTCGTCTTC AAGGTGACAT 4260
 AGAAAAACGG GAATCTTTGA ATTTAGATAC TTCCGCACTT GTTCGTCAAC TTAAAGATAT 4320
 15 TGAAAATGAA ATTAGAAACG TTCGTGCTCA AATGCAAGAT TAATAATCTA TCATTCAAGC 4380
 AATAAATGCT TTTTGTACA TAAATTGAC TAGCATTGCT CTGAATACGT TATATTGATG 4440
 AATTGCTTCA TTTTTCGCTC AATTACATCT AGAATCACAA GATGTTGTCG TGTATGATT 4500
 20 TAGTGTTC AATAACAT ACACGCATAT CTATCCCAAC ACTGCTATTT ATGTTTTCTA 4560
 CGCTGnTGTA CTACATGAAC CCTTTGAAAC GGAGAGGAAG TTATCATATG CAATTTTAnC 4620
 25 TGATTTTACT AGCAATACTT TAACnAATTG nTAGTTTAAT AGAATTTTA 4669

(2) INFORMATION FOR SEQ ID NO: 133:

(i) SEQUENCE CHARACTERISTICS:

- 30 (A) LENGTH: 2785 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 133:

35 TTTGcACCCA TCTGaTACAA TGCACCATGC GGTtTAACAT GATTaATTTT AACTTGATGA 60
 ATGCGACAAA ACCCTTGTA TGCACCTAAT TGATAAATCA TCAAATTATA AATCTCGTCG 120
 40 TTAGAGATAT CTATATTTTCG TCTGCCAAAG CCTTTCAAAT CAGGTAAACC AGGATGTGCA 180
 CCTACTGCAA CATTATGTGC TTTGGCAAGT TTTACCGTTT CATTCAATAC ATTTTCATCA 240
 45 CCAGCGTGAA AACCAAGC AACATTCGCA CTGTAAATTA ACGGAATAAT TTGATGATCA 300
 CCACCAAGG AATAATTTCC AAATGCTTCG CCTAAATCAC AATCAAATC AACTCGCATT 360
 ATAATTCCAC CCCTTAACA ATTTGATGTT TTTCTAAAAA TTTAATATCA ACATCTTTTG 420
 50 CATCTCCATC ACATATAGT GGATAATTTA AAAGTGCATA TAAAAATCG GCAGTTGTAG 480
 AAAATCCATC TATCACCATT TCATCTAAGG TGACTTTCAA CTTATCAATT GCTGAAGCTC 540

55

EP 0 786 519 A2

	AACCGTGATA TAGTAAAGAA TCGACTCGCA CATTAAAGCC TTGAGGTAAA TGTAACGCTG	660
	TCACTTTACC TGGTGTGGT TGAAATTTCT TTTCaGGATT TTCGGCATT ATTCTCGCTT	720
5	CTATCACATG ACCATTAAAT TGAATATCGC TTTGTGAAAA AGGTAAATGA TTATGTTCCA	780
	ATAAATACAG TTGTGCTGCA ACCAAATCAC GTTCTGCTCG CATCTCTGTA ACAGTATGTT	840
	CAACTTGTAT TCGAGCATT C ATTTCAATAA AGTAATGTGC GGTATCAGTT ACTAAAAATT	900
10	CAATCGTACC TGCACCTTCTA TAATTTGCTG CACGTGCAAC TTTAACAGCA TCGTTACATA	960
	TTTGTGTGCG TCTTTCTTCA GTTAATGCTG CACAAGGAGA TTCTTCGATT AATTTTGTAT	1020
	TTTTACGTTG TACAGAACAA TCACGTTCCC CTAAATGTAC ATAATTATCC TGCCCATCTC	1080
15	CCaTAACCTG AACTTCAACA TGTTTTGcAA CAGGTATAAA AGCCTCAACA TAAACACGAT	1140
	CATCATCAAA GTATTTTTTT CCTTCACTTT TAGCTTCTTT AAATGCCTTT TCTAAATCTT	1200
20	CAGCTTTCTT TACAATACGT ATACCTTTAC CACCACCGCC ACTGGCAGCT TTGATAACAA	1260
	CTGGATAACC GATGTCTTTG GCAAGATTCT CAATTCAGA CACATGATTC ACAGCACCAT	1320
	TTGATCCTGG AATCACAGGA ACACCTGCAT GATGAACTGT TTGTCTTGCT GTTATTTTAT	1380
25	CCCCCATCAT TTCCATCGTT TTTTGTAGTAG GCCCTATAAA CGCTATGCCT TGTTCCTCAA	1440
	CGGTTTGAGC AAATTTTGTT GATTCTGATA AAAAGCCATA TCCTGGGTGA ATTGCATTAG	1500
	CACCAGTGAT TTGTGCAGCA GATATGATGC GGTCAATATT TAAATAACTA TCTAAaCAT	1560
30	TArCwTCCCC AATACATATA GCTTGATCTG CTAAATGTAC ATGCAAGCTT TGCTCGTCCC	1620
	CTTTTGATA AACTGCTACA GTTTCAATCC CATATTCTCT GCAAGCTCTT ATAATCCTTA	1680
	CAGCAATTTT ACCTCTGTTC GCAATTAAAC AACGAAGCAT TTACTTACCC CCTTTACTTA	1740
35	ATACGTACCA AAACCTGGTC GTATTCAACA TTTGTGCCAT GATCAGCTAC TATTCAGTA	1800
	ATTCTCCAG CAACATCTGT TGTTACCTCG TTTAATACTT TCATCGCTTC AACATATCCT	1860
40	ATAATATCTC CCTGTTAAC TTTGTACCG ACATTACAA TTGGTTCAGT TAATTCTTTA	1920
	CTATCTTGTA AAAAGAATGT ACCTATCATT GGTGATTTAA TGTATGATA ATCATTTGTC	1980
	GAAACATCGG AGTTATCATT CGCTTTTGAA GCTGTCAAAT CATTATGTT CATACTTTGA	2040
45	TTGATTGAT TACTGTGTGC AGCCAAATGA TTCGAGTCAG TGAAGTCAAT TTCTATTTCA	2100
	TCTTCAAAAT TTTTATATTT AAATTTCTTA ACATCATTTT CCTTCACTAA TTTGATTATT	2160
	TGTTTCGATT nTTCAATATT CATTTTACAA ATCCCCTTTT AAAATTGTTG CTAATTTTTT	2220
50	CGAAGTATGT CGCAAGCTAG ATGTATCAAA AATTGGAGTC TTTTGATGAC TCTTAAGAAT	2280
	TTCAATTAAAC AGAGACATTT GTTCCCGATT CTTATCTACA GCTTCTTGGA ATGATATCCA	2340

55

TACAGTTGCA ATTTTGGTAT AACCACCTAT CGTTTGTTTA TCATTAAGCA GAATAATAGG 2460
 TTGACCATCA TTTGGTACCT GAACACTACC AAGAGCAACC GGTTCAGAAA TGATATCTGC 2520
 5 TTGATTAAcT GGTGCAACGC TGTCACCTTC CAAACGATAG CCCATACGGT CTGATTGTTC 2580
 AGTAATTAAA TATGGATGAT TTACAATTTT CGCTCTAGCC TCTTCAGAAA ATGCCTCGAA 2640
 TTGAGGTCCT TGAAGAATGT GTATAATATT ATTTTCTGGC AATAAATCGT CCTGTAAATG 2700
 10 AATCGTCTTT CCAATGTTTT CTTTAAAGTC ATTATTTATT TTCACTGTTA TTACATCATC 2760
 AGCTAATAAC TTTCTACCTT TGAAT 2785

(2) INFORMATION FOR SEQ ID NO: 134:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 1010 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 20 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 134:

25 AATGGAACG GTTGAACAG CAATTATTAC TATTTCTATG GGTGAAGGTA TTTCAGAGAT 60
 ATTTAAATCA ATGGGTGCCA CACATATCAT TAGTGGTGGG CAAACGATGA ATCCTTCTAC 120
 AGAAGATATC GTTAAAGTCA TTGAACAATC AAAATGTAAA CGTGCAATTA TTTTACCGAA 180
 30 TAATAAAAAT ATCTTAATGG CAAGTGAACA AGCAGCGAGT ATTGTTGATG CAGAAGCTGT 240
 TGTATTCCA ACGAAATCTA TTCCTCAAGG TATAAGCGCA CTATTCCAAT ATGATGTGGA 300
 CGCAACACTT GAAGAAAATA AAGCGCAAAT GGCTGATTCA GTAAATAACG TTAAATCTGG 360
 35 TTCATTAACG TACGCTGTTC GTGATACGAA AATTGATGGC GTTGAGATTA AAAAAGACGC 420
 GTTTATGGGC TTGATTGAAG ATAAGATTGT AAGCAGCCAA AGTGATCAAT TAACAACGGT 480
 TACTGAGTTG TTAAATGAGA TGTTAGCAGA AGATAGTGAA ATATTGACTG TGATTATTGG 540
 40 TCAAGATGCA GAGCAAGCAG TTACAGATAA CATGATAAAC TGGATCGAAG AGCAATATCC 600
 AGATGTAGAA GTGGAAGTTC ATGAAGGTGG ACAACCAATT TATCAATATT TCTTTTCAGT 660
 AGAATAAAAA TTAAAATAA AAAACTACCA ATGATAAATC ATCAGTTGGT AGTTTTTTAT 720
 45 TTTGCTATTT TAGTGATATT GCGGGTTAAA AGTATCGTTC TCGAGTTGCT AACAATGTCA 780
 TGTTCAACTT AGTCATGATA AAATAAATAA CATACTAAAT GATACGTAAA ATCAAATAAA 840
 50 ACATAGGTGA TTTATTTTGG CTAAAGTAAA CTTAATAGAA AGTCCATATT CTCTTTTACA 900
 ATTAAGAGGT ATAGGTCCTA AGAAAATAGA AGTATTGCAA CAACTAAATA TTCATACAGT 960

(2) INFORMATION FOR SEQ ID NO: 135:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1540 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 135:

	TGTAGTTGAA CATGAACAAC AAAAGAAAGA AAAGACAAAA AAGCAATACA AGCCATTTTG	60
	GATTGTCATG AGTTTTATAA TACTTATAGT TGTACTATTA CTCCCGGCAC CTTCAAGTCT	120
15	GCCGATAATG GCTAAGGCAG TACTAGCTAT TTWAGCTTTT GCAGTTATTA TGTGGGTAAC	180
	GGAAGCTGTA TCATATCCGG TGTCAGCAAC TTTAATTATT GGCTTAATGA TATTACTTTT	240
20	AGGATTTAGC CCTGTTCAAA ATTTAGGGGA GAAGCTAGGT AATCCGAAAA GTGGCAGTGC	300
	TATTTTAGCT GGAAGTGACC TTCTAGGAAC TAATCATGCA TTATCATTAG CGTTTAGTGG	360
	ATTTGCAACT TCAGCTGTAG CTCTCGTTGC AGCTGCATTA TTTTGGCTG CTGCTATGCA	420
25	AGAAACGAAT TTGCATAAAA GACTAGCTCT TTTAGTGTTA TCAATTGTTG GTAATAAAAC	480
	TAGAAATATA GTTATTGGAG CAATTATCGT TTCAATTGTA CTTGCATTTT TCGTTCCTTC	540
	TGCAACAGCT AGAGCAGGGG CAGTTGTACC AATCTTGCTG GGTATGATTG CGGCATTTAA	600
30	AGTTTCCAAA GATAGCAAGT TAGCGTCTTT ATTAATAATT ACTTCAGTAC AAGCTGTGTC	660
	AATTTGGAAT ATTGGTATCA AAACGGCGGC AGCACAAAAT ATCGTAGCGA TTAATTTTAT	720
	AAACCATCAA TTAGGATTG ATGTTTCATG GGGCGAGTGG TTCTTATATG CAGCGCCTTG	780
35	GTCCATAGTT ATGTCCGTAG CTTTATATTT CATCATGATT AAAGTGATGC CTCCAGAAAT	840
	TAATACAATA GAAGGTGGTA AAGATTTAAT AAAAGAAGAA TTGCATAAAC TTGGCCCCGT	900
	TAGCCACAGT GAATGGCGTT TAATTGTTAT ATCGATGTTA TTATTACTGT TTTGGTCAAC	960
40	TGAAAAAGTA TTACATCCGA TTGACTCTGC ATCCATTACT ATTATTGCTT TAGGTGTTAT	1020
	GTTAATGCCG AAAATTGGTG TCATGACATG GAAACATGTT GAAAATAAAA TACCATGGGG	1080
45	AACAATTATC GTGTTTGGTG TAGGTATTTT ACTAGGTAAC GTTCTTTTGA AACAGGTGC	1140
	AGCTCAATGG TTAAGTGATC AAACTTTGG TGTTTTAGGT TTAACATT TACCTATTAT	1200
	CGCGACAATT GCACTTATCA CGCTTTTAA TATATTGATT CATTTGGGCT TTGCGAGTGC	1260
50	AACAAGTTTA TCATCAGCGT TAATACCTGT TTTATTTTCTA CTAACCTCTA CGTTACACTT	1320
	AGGAGACCAG TCTATAGGAT TTGTTTAAAT TCAACAATTT GTTATTAGTT TTGGTTTCTT	1380

AGATTTCCTTG AAGGCAGGTA TACCATTGAC AATTGTAGGG aATAtctAgT GaTAGTTT 1500
 AGCATGACTT ATTGGAAATG GGTAAGGTTG CnTTAATTAA 1540

(2) INFORMATION FOR SEQ ID NO: 136:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 11823 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 136:

ACTTCTCACA ATAAGAAATA TGAAATTGTT ATGTGTTAGT TGAGATTCAG TGATGAATTA 60
 CTTTTATCAT TTAAATGTT GTTATCATTG TCATGCGTTA CCAAATCGCT TACGTATACA 120
 CGATTCCCAA TCTTAACATA GACGATTGT ATATCAGAAT TTTCTGATTA CTAACAGTTT 180
 ACCTAAGTTT AAATATCTGT TCAATGATTT TCAGTTATTT TAAAAGAAA AATCGTAATG 240
 CTGCCATGAT AACAATCCCA CTAATAATTG TAATAGTTAA AtACGCGTGA TTATAGATAA 300
 AATAACCGTC GGAATGAGCG CGATAATGTA AGGGATGTTT AATGTATACC CCTCACCATG 360
 AGGCGTCTGT TGAATAATGC TGTCAATGAC AAGTGCCGTA AATAGTGTGA TTGGGATAAA 420
 TGATAGCCAT CGAACCACGA CATCAGGCAA TTGCACTTTT GAAATCATGA TAAAAGGTAT 480
 AATTCGAATT AATAGCGTTA CGATACCACA CAATAAAATA AGTATTAACA TGTTCATATG 540
 AGTTATCAIT GTTCCATCAT CACTCCTAAC GCTGCTGAAA TTGTGGCTGC AATTAATATT 600
 GCTAGATATG AAGGCATAAA CATACTTAGC GATAACATCA TTAATATGAC GGCAATAATG 660
 AGTACTATGT AAATCTTAA TCGCGATTTA GTAATTGATT CAAATTGCGC AATGGCCAAA 720
 AAGATAAACA TAGCCGTGAT AGCAAAATCT AACCTAGCG TTTGCGGATT TGAGATATAT 780
 TCGCCAAATA AAGCCCCAGC TACACATGAA ATTGCCCAA ATAAATATGC TGTGATGTTA 840
 AGACCATGCA TCCAACGATC ATTGATAGCT TCTCCTTTA AATAAGGTGT AATGGCGACG 900
 CCAAACGTTT CGTCAGTTAC TAATGAACCT AATCCAACAC GGTCCAATA CCCATATGTC 960
 TTGAAGTTTG GTGCAAGCGA CATACTTAAA AGGAACATTC TTGAATTTAC GATAAATACA 1020
 GTTAGTACAA TCGCTGATAT AGGTGTACCT GCTATAAACA ACGCGCACAT AATAAATTGC 1080
 GCAGcaCCGG CATATATAAC AAGACATAAC AAGACAATTT CTAAAATACT AAAGTTTTGA 1140
 GACGAAGCCA CAATACCAAA TGAAATACCA ACACCGGCAT AACCCAATAA TGTGGGATA 1200
 CACTCTTGCA CGCCTTGCT AAAACTTAAA TGTGTTGTCA TCTCAATTAC CTCCTTTGCC 1260

EP 0 786 519 A2

	TAAGCAATAA CATTAGACAT CAGTTTGTCT GAGGTTAGAC ATTCCGGAGT CTTTAGTCAG	1380
	CTTCATATTA ACTTTTTATT TTTGAGAATT TTCAATTTTT TATTTAAGAC TACCTCCATA	1440
5	TTTTCTATGG aTTTGTAGTT GTTTTTAAGT ATCAATTTTA TAAATTTTTTA TATCTGATGA	1500
	TGAGTCTGGG aTATTGaTTC ATGTACCACT CCCTTaTaAT CATCCCCTCC CCCTaCCCTA	1560
	CTCCATCGAT ATAACTCATA CTACATATCA ACGAAATCAG TATTTTATCG CTTCTTTTCC	1620
10	TATATTAGTG ATGCTCAAAC TTGTTACGTT TTAGATTGTT TTAGTTCATC ATAATTATCC	1680
	CGTATTGTTG CTATAATGAA ATGCGTTCAC CCCATTAAAC CACAACTTA ATTTATTGTT	1740
	GTTATGTGCA TTGGCTCACT ATTATATTTT TACAGCACAA AAAAAGTGGC GACAGTTCGT	1800
15	CACCACTTTT TAAATATTA TTTAAAGTAT CTTGCCCTTG CTTTAAGTAT ACGTAGATAT	1860
	ATACTTTTTA AAGCTTGTAG CTAAAGCCTT TATTTAACTG GTTTTGAAAT TTGTGTTTTA	1920
	CCACCCATAA ATGGTACTAA TGCTTCTGGA ATTGTTACTG TTCCATCTTC ATTTTGGTAA	1980
20	TTTTCAACAA TAGCAGCAAA TGTACGTCCA ACTGCTAAAC CACTACCATT TAATGTATGT	2040
	GCTAATTCTG GTTTAGCTGC TTTGTCACGC TTGAAGCGGA TGTTAGCACG ACGCGCTTGG	2100
25	AAATCCGTAC AGTTTGAGCA TGAAC TAATT TCTTTATAAT CATTGTAGCT TGGTAACCA	2160
	ACTTCTAAAT CATATGTTTT GCTTGCACTA AATCCAATAT CACCTGTACA TAAAATAACA	2220
	CGACGGTATG GTAAACCTAA CTCTTCTAGA ATTGCTTCTG CGTTTGTGTG CATTCTTCT	2280
30	AAAGCATTCC ATGAATCTTC AGGTGTTCA AAACGTACCA TTTCCACTTT ATCGAATTGA	2340
	TGTAAACGAA TTAATCCTCT TGTATCTCTA CCTGCTGATC CTGCTTCACT ACGGAAACAT	2400
	GCAGATTGAC CAGTGAATTT TTCAGGAAGT ACACCTGGTT GAATAATTTT ATTACGGTAG	2460
35	AAATTCGTTA ATGGTACTTC AGCAGTTGGA ATTGTATATA ATCCTTCTTT TTCTACTTTA	2520
	AATAAATCTT CTTCAAATTT AGGTAATTGA CCTGTACCAT ACATTGTATC TGC GTTCACA	2580
	AGCTGTGGTA CCATCATTTT TGTATAACCA TGTGTGTGTG TATGTTTTGT AATCATATAG	2640
40	TTCAATTAAG CACGCTCTAA TTGCGCACCT TCATTTGTTA AATATACAAA ACGCGCACCT	2700
	GAAACTTTTG CTGCACGATC AAAATCAGCC ATTTTCAATT CTTCTACAAT ATCCCAATGT	2760
45	GCTTTGGGTT CAAATGAAAA CTCaCGTGGT GTACCCCACT TTTTAACTTC AACGTTATCT	2820
	TCATCAGATT CACCTTGAGG TACATCATCA CTTATTAAAT TTGGAATACG ACAAAGGATA	2880
	CCTGTCATTT TATTATCAAT TTCATTTAAT TGA CTATCTT TTTCTTTAAT ATCGTCACCT	2940
50	AATGTGCGCA TTTAGCAAT CACATCATCA GCATTTTCTT TATTACGTTT TTTAATGCG	3000
	ATTTCTTCGC TTACTTTATT ACGACGTGCT TTCATTTCTT CTGTGCACT AATTAATTTA	3060

55

EP 0 786 519 A2

	TCAATTTTGC TCTTAACTGT GTCAGGCTCA TTTCTGAATA ATCTAATGTC TAACATTAAC	3180
	CTTCATCCTT TCCCAAATAA TTATCATTTA TTATGGAATG ACGTACGTCT TTATTTTSTA	3240
5	GAAAATAAAA AAAGACCACA TCCCTACAAG GGACGTGGTC TACGCGTTGC CACCCTATTT	3300
	AACAATTTAA GTTATAAAGA TACACTAAAC CTAAATTGCA CTTCCTAAA ATAACGGTTA	3360
10	TCACCGATTG TTCTTTTAAA TTAAGTAGGT AGATTTCATAT ATATGTTGAT TCTTGTTTAC	3420
	ACTAACCACA AGCTCTCTGA TATCGAACAC TATATATTAC TTGTCCTACG AACAAATGCT	3480
	TATTAAGTTA TTTTAAATAT AGCAAACAT ATTTGCTTTT TCAAGTAACG ATTTCAAACA	3540
15	TCACTCATGT CGATTAGTG ACATGCAGTC GTTTGATAAA TTGATTGCTT TAAATACTGT	3600
	GCAACCGCTT CAATATCTTT ATGAAATTGA CGATCATGTG TAATGGATGG CACGATACTT	3660
	CGAAACTCAT CATACTTGCG ACGTGTTTTT GGTGATAATC CTTCAACACC TTTTAACTCT	3720
20	GCTGCTTGTA ATGCAATAAC ACATTCGATT GCCAGCACAC GTCTTGCAAT TTCAATAATT	3780
	TGATAACCAT GTCTAGCAGC TGTAGTCCC ATAGATACGT GATCTTCTTG GTTCGCAGAT	3840
	GAAGTGATAG AATCAACACT CGCTGGATGC GCTAAAGTTT TATTTTCAGA AACGAGACTT	3900
25	GCAGCAGCAT ATTGCATAAT CATCGCGCCA CTTTGCAATC CTGGCTCTGG ACTAAGAAAT	3960
	GCTGGTAAAT CACCATTAA TTGAGGATTT ACTAGTCGCT CTAGACGACG TTCCGATACG	4020
	TTTGCTAATT CACTTACACC TAATTTAAGA TGATCTAATG CAAAAGCAAT AGGTTGTCCA	4080
30	TGGAAGTTAC CACCTGAAAT AACAAACGTT TCATTTGCTT CCTCAAATAT AAGTGGATTA	4140
	TCATTAGCCG CATTCATTTC AAATTCTAAT TGCTGTTTAA CATAATTGAA TACTTGAAAA	4200
	CTCGCGCCAT GGATTGTGG TATACAACGC AACGTATATG CATCTTGATC ACGTATTCTT	4260
35	GATTGTCGCG TCGTTAATGT TGATCCTTCT AACCAATCAC GCATACGCGC TGCCACATTA	4320
	ATCTGTTCTT GAAAATTACG AACTGCGTGC ACATCATGTC GATATGCATC TATAATGCCA	4380
	TTAAGAGACT GATGCGTTAA TGCAGCAATC CATTGAGATT GGTAACCTAA ATCTTCTGCT	4440
40	TCTATATAAC TAATGACACC TTGAGCTGTC ATAGCTTGCG TACCATTAAAT CAATGCTAAA	4500
	CCTTCTTTAG CCTGAAGGTT CAAAGGTTGT CTATTTAATT CTCTTAATAC ATCGTCACTA	4560
45	TCCTTTTCTT CCCCTCTGTA CAATACTTTC CCTTCACCAA TTAATGCTAA TGCTAAATGT	4620
	GATAATGGCG CTAAATCTCC TGATGCACCG AGAGAGCCTT GCTGTGGGAT TATCGGTATA	4680
	ATACGTTTAT TTATAAAAAA TTGTAATTGT CTCCTAATT CTAAAGTGGC ACCTGAATGA	4740
50	CCTTTTAATA ATGTATTCAA TCGTAAAATC ATCATGACTA ATGCTACTTC TTTTGAAAAT	4800
	GGCTCACCTA GTCCACAGGC ATGTGAGCGT ATCAGATTCA CTGTGAATTC ATTATATTGC	4860
55		

EP 0 786 519 A2

TCCTCATT TT CAATAATACG TTCAACTACC GCTCTACTTT TTTTGACACG TTCTAACGCA 4980
 TCATCAATAA TTTCAATCTT TGATTGTTGT TGTA AAAATG ATTTAATATC CTCAATTGTT 5040
 5 AGTGTTTCAC CATCTAAATA TAAAGTCATA TATGTTACCC CCTTGTTTAT ATTAAGTAAC 5100
 CCATCCTTCT TGAAGTATAC GTTTTCATTT TTATTGAAAC AATGGTTTTA CGTACATTTA 5160
 TAACCTATTA TCAGAGCACT ATTGTAGTGC GTTAAAGGAT ATTAAGATTG TTGTAAGCAT 5220
 10 ATTTAATAAT TTATCTATTG ACGAATTGCA TATACAGGTA TAGTATTTTC TATTGTATTT 5280
 AACGACAAAT AATAATGAAT TCAGAAATTT ATAATACATT TTGTTAAAAG TTACTATATA 5340
 TTTTTAAAAT TGAATAAATT CGGAAAAGGC TTTTACATGG GAGGTTATAT CACTATGGAA 5400
 15 ACGTTAAATT CTATTAACAT TCCTAAGCGT AAAGAAGATT CACATAAAGG TGATTATGGC 5460
 AAAATTTTAT TAATTGGTGG ATCTGCTAAC TTAGGTGGTG CCATTATGTT AGCGGCTCGT 5520
 GCATGTGTAT TTAGCGGTAG TGGTTTAATC ACTGTAGCTA CACATCCAAC AAATCATTCA 5580
 20 GCATTACATT CTCGTTGCCC AGAAGCGATG GTTATTGATA TTAATGATAC GAAATGTTG 5640
 ACGAAAATGA TTGAAATGAC TGACAGTATA CTAATTGGTC CAGGTCTTGG CGTTGATTTT 5700
 25 AAAGGAAATA ATGCCATTAC ATTCCTACTA CAAAATATAC AACC GCATCA AAATTTAATC 5760
 GTAGACGGCG ATGCGATTAC AATCTTTAGT AAAGTGAAC CGCAATTACC TACATGTCGT 5820
 GTGATCTTTA CACCACACCT CAAAGAATGG GAACGATTAA GTGGTATTCC TATTGAGGAA 5880
 30 CAGACATATG AGCGTAATCG TGAAGCAGTT GATCGTTTAG GTGCAACTGT TGTACTTAAA 5940
 AAACATGGTA CTGAAATTTT CTTTAAAGAT GAAGACTTTA AATTGACAAT CGGTAGCCCA 6000
 GCAATGGCGA CTGGTGGTAT GGGCGATACA CTTGCTGGTA TGATTACAAG CTTTGTCGGT 6060
 35 CAATTTGATA ACTTAAAAGA AGCGGTTATG AGTGCCACAT ATACACATAG TTTTATTGGC 6120
 GAAAGCCTTG CAAAAGATAT GTATGTGGTG CCACCATCAA GACTTATCAA TGAAATACCT 6180
 TACGCAATGA AACAATTAGA AAGTTAGTCA TTACTAATCA TTGAATATAG TAAAGCATT 6240
 40 CTTTCTAGCA TAAAAATAAG ACTCCCCTAC ATATAGGGAA GTCTTATTTT TTATTATTCT 6300
 TCATCTGATG ATTGTTGTAT ATCTTCTTCA ACACGATCCA TGAAATCTTG TCTTACTTCA 6360
 ATACGTCCAT CTTTCATCATT TTCTTCTGAA TCAATCACTT CAGTATGAAT TGCATTTCTT 6420
 45 GGTGTTTCAT CATTTaCAAC CGCTTCACGT TGTGTTTCAG TACCATCTTC AGATACAGTT 6480
 GAAGTAGATT GCTCATCTTC ATTCGTTTCA TCTTCTGCAT CTTCTTTTAC TTTAGCAACC 6540
 50 GTTGAAACAA ATTGATCATC ACCTAAGCGA ATTAAGCGAA CACCTGTGTC TGCACGACCA 6600
 TTTTGAGAAA TATCTGCAAC ATCTAGTCGA ATAATGACAC CTGCATTAGT AACAATCATT 6660

55

	GTAGCTGTTT TAATACCTTT ACCACCACGA TTTGATAAGC GATAGTCATT AACTGGCGTA	6780
	CGTTTACCAT AACCATTTTC AGTAACTACT AATACTTCAT CAACACTGTT TGCATGAGCT	6840
5	ACATCAAGCC CTACAACCTC GTCACCTTCA CGAAGTGTA TACCTTTCAC ACCCGTTGCT	6900
	GTACGGCCTA AAGGACGTAA TGTGATTCA GGAATCGAA TTAATGATGC ATGTGATGTA	6960
	CCAATCAAGA TATCTTCTTG ACCACTTGTT AAGCGAACTG CAATTAAGTC ATCATCTTCT	7020
10	CTGAACGAAA TCGCAATCTT ACCATTTCTA TTTATTCTTG AGAAGTTACT TAATGCTGAA	7080
	CGTTTAACGA CACCACGTTT AGTTGCAAAC ACTAAGAAGT TGTCTTCACT TTCAAGGTCT	7140
	TTAACAGCAA TCATTGTA CT AATGACTTCA TCATTTTCAA GTTCAATAGC ATTCACTACA	7200
15	GGAATACCTT TAGACTGTCT TGATAACTCA GGCACCTCGT AACCTTTAAG TTTGTATACA	7260
	CGACCTTTGT TAGTAAAGAA CAATACATGG TCATGTGTAC TTAAAGTTAC CAATTGACTG	7320
20	ACAAAATCTT CTTCCAATGT ATTCATACCT TGAACACCAC GACCACCACG GTTTTGAGCA	7380
	CGATATGTAG ATACCGGCAA ACGTTTAAAG TAGTTATTAT GGCTTAGTGT AATTACTATT	7440
	TGTTCTTCTG GAATTAAGTC TTCGTCCTCT AAGTCTTCAA ATCCACCTAA TTGAATTTCT	7500
25	GTACGACGAT CATCACCGAA ACGATCTCTA ATTTCAGTCA ATTCATCTCT AACTAACTGT	7560
	AATAACACTT CTTTCATCAGC TAAGATTGCT TCTAATTCAC TAATATAATT TAATAACTCA	7620
	TTATATTAG CTTCAATTTT GTCTCTCTCT AAACCTGTTA GACGTCTTAA ACGCATGTCT	7680
30	AAAATAGCTT GAGCTTGTTT TTCAGAAAGT TTGAAGCGTT GTTGCAAGCT TTCCATTGCA	7740
	ACTTTATCTG TATCTGACTC ACGAATCGTT GAAATAATTT CATCGATATG GTCAAGTGCG	7800
	ATACGTAATC CTTCTAAAAT GTGGGCACGA TCTTTAGCTT TACGTAAGTT GTATTGCGTA	7860
35	CGTCTTCTAA CAACTGTCTT TTGATGCTCT AAATAATGTA CCAACGCTTC TTTTAAATTA	7920
	ATAAGCTTCG GTCTACCATT TACAAGTGCA ATCATATTCA CACCAAATGA TGTTGAAGA	7980
	GGTGTTTGTT TGTATAAGTT ATTTAAAATG ACACTAGCAT TTGCATCCTT ACGCACATCA	8040
40	ATAACGACAC GCACACCACT ACGTAAACTT GTTTCATCAC GTAAATCAGT GATACCGTCA	8100
	ATTTTCTTGT CACGAACGAG CTCTGCAATT TTTTCAATCA TACGAGCCTT ATTCACTTGG	8160
	AAAGGAATTT CAGTGACAAC AATACGTTGA CGTCCGCCTC CACGTTCTTC AATAACTGCA	8220
45	CGAGAACGCA TTTGAATTGA ACCACGACCT GTTTCATATG CACGTCTAAT ACCACTCTTA	8280
	CCTAAAATAA GTCCAGCAGT TGGGAAATCA GGACCTTCAA TATCCTCCAT TAACTCAGCA	8340
50	ATTGAAATAT CAGGGTTCTT ACTTAAGCTA AGTACACCAT TGATTAATTC TGTTAAGTTA	8400
	TGTGGTGGAA TATTCGTTGC CATACCTACC GCGATACCTG ATGCACCATT GGCTAATAAG	8460

55

EP 0 786 519 A2

	AAATCTATTG TATCTTTATT AATATCACGT AACAGTTCAA GTGTGATTTT AGTCATACGC	8580
	GCTTCAGTAT AACGCATTGC TGCTGCGCCA TCTCCATCCA TTGAACCAAA GTTACCTTGG	8640
5	CCATCAACAA GCGGATAACG ATAAGTAAA TCTTGAGCCA TACGTACCAT TGCTTCATAA	8700
	ATAGATGAGT CACCATGAGG GTGATATTTA CCCATTACGT CACCAACGAT ACGTGCTGAT	8760
	TTTTTATATG ATTTATCCGG TGTACATCCT TGTTTCATTTA ATCCATATAG TATACGACGA	8820
10	TGTACTGGTT TTAAACCGTC ACGAACATCT GGCAATGCAC GAGCAACGAT AACACTCATC	8880
	GCATAATCTA AAAATGATTC ACGCATTTC A CTGGTAATAT TTCGTTTCATT TATTCTTGAT	8940
	TGAGGTAATT CAGCCATCAA GAGTTCCTCC TTCAAAAGTT CAGTTCACAG CGCTTAGAAG	9000
15	TCTAAGTTTG CATAAACTGC ATTATCTTCT ATAAATTGTC TACGGTTTTT TACAACGTCA	9060
	CCCATTAACTA TTTCAAATGT TTGGTCCGCT TCAATCGCAT CTTCAAGTTT TACTTGTAAG	9120
	AGAGCGCGGT GCTCAGGGTT CATTGTTGTT TCCCATAAAT GATCTGCATT CATTCTCTCA	9180
20	AGACCTTTGT ATCGTGCAAT AGACCATTTT GGTGTTGGAT TCAATTCAGA TTAAAGTTA	9240
	TCAAGTTCCC TATCATTGTA TACATAATAC TTTTGTTTAC CTTGTGTCAG TTTATACAAC	9300
	GGTGGCTGTG CAATATACAC ATAGCCTGCT TCAATTAACG GTCTCATAAA TCGATAGAAG	9360
25	AATGTTAATA ACAATGTTCT AATATGCGCT CCATCCACAT CGGCATCAGT CATAATGACG	9420
	ATTTTGTTGAT ATCTTGCTTT CGCTAGATCA AAGTCGCCAC CGATTCTGT ACCAAATGCT	9480
	GTGATCATT GACGAATTC ATTGTTATTC AAAATTCTAT CTAATCGTGC TTTTCAACA	9540
	TTTAATATCT TACCTCGTAA TGTAATAATC GCCTGCGTTC TAGAGTCACG ACCAGATTTT	9600
	GTAGACCCCC CGGCAGAGTC CCCTTCGACT AAGAAAATCT CACATTCTTC AGGACTTTTA	9660
35	CTAGAGCAAT CGGCTAATTT ACCTGGAAGG CTTGCTACAT CTAACGCTGA TTTACGACGT	9720
	GTTACTTCAC GCGCTTTTTT CGCAGCAACA CGTGACGTC CCGCCATAAT ACCTTTTTCA	9780
	ACCACTGTAC GTGCGACTTG TGGATTTTCA TATAAAATC GTTCAAAGTG CTCTGAGAAT	9840
40	AATTTATCTA CAACTTGACG CACTTCAGAA TTACCTAATT TTGTCTTCGT TTGACCTTCG	9900
	AATTGAGGAT CACCATGTTT GATAGATATA ATTGCTGTCA TACCTTCACG TGTATCTTCA	9960
	CCAGAAAGTC TATCTTTTTT TTCTTTCATA ATCTTGCTAC TTAAACCATA ACTATTTAAG	10020
45	ACACGCGTTA ATGCACGTTT GAATCCGTCT TCATGCGTAC CACCTTCATA CGTATGAATG	10080
	TTATTTGCGT AAGTTAAAAG ATTTGTGGCA TATCCTGAGT TATATTGAAT CGCAATTTCT	10140
	ACTTCAATAT CATCTTTAGA TTGATGAATA TAAATTGGCT CATCATGAAT AGGTTCTTTA	10200
50	TTTTCGTTCA ATAAGTCAAC GTACGATTTA ATACCGCCCT CATAGTGATA GGAGTCTTCT	10260

55

GCAAGCTCTC TAATACGCTG CTGTAATGTT TCATAGTTGT ATACAGTTGT CTCTGTGAAG 10380
 ATTTCTCCAT CTGCTTTAAA ACGAAtGaCA GTACCTGTCT TAtCAGTnGT GCCAACTTCT 10440
 5 TTTAAGTCAA ATTGAGGTAC ACCTTTTTTA TATGCTTGAT GATATATAGT CTCATTTCTG 10500
 TGTACATATA CTTCTAAGTC TTGTGACAAT GCGTTTACAA CTGATGAACC AACACCATGT 10560
 AAACCACCAG ATACTTTTGA TCCGCCACCG CCAAATTTAC CACCAGCATG TAAAACAGTT 10620
 10 AAAATAACTT CGACAGCTGG ACGTCCCATT TTTTCTTGAA TATCAACTGG GATACCACGT 10680
 CCGTATCCG TTACTTTAAT CCAGTTATCT TTTTCAATAA CAACTTCAAT TTGATTTGCA 10740
 TAACCAGCTA ATGCTTCATC GATACTATTA TCGACAATT CCCACACTAA ATGGTGCAAA 10800
 15 CCTCTCTCTG AAGTCGATCC TATATACATA CCTGGTCTTT TACGTACTGC TTCTAAACCT 10860
 TCTAATACTT GTATTTGCCC AGCACCATAA TTATCCGTGT TGTTTACATC TGACAATGCA 10920
 GTCACCATCG CTTTCTGTTA CTTTATAATT TCACCTTGAT TAATACGATA CAATTTAGCG 10980
 20 TTATTCATGA TTTTCATGATC AATACCATCT ACAGATGTCG TAGTGACAAA TGTTTGTACT 11040
 TTATGCTGAA TCGTACTTAA TAAATGCGTT TGACGCGAAT CATCTAATTC ACTGAGTACA 11100
 25 TCGTCTAATA ATAAGATGGG ATATTCCCCA ACTTCGATAT TCATTAACTC AATTTTCAGCT 11160
 AATTTAATGG ACAAAGCCGT TGTACGTTGC TGTCTTGAG AACCATATGT TTGAGCATCC 11220
 ATGCCATTCA CATCAAACT TATATCATCT CGATGTGGTC CGAATAAGCT AATGCCTCGT 11280
 30 TCTTTTTCTC TTTGCATATT ATCGCTAAGA ATAGACATAA TTTCTTCAAG TCGTGCCGCT 11340
 TCATTTTGAG CATAATCAAA TTTAAGACTA GGTAAATAAT TCAGCGACAA CGCTTCTTTA 11400
 TCATTTGTGA TACCAGCATG AATCGGTTTA GCTAACGACT CTAGCTCTTG AATAAAATGT 11460
 35 GCACGTTTAT CAGTTACTTT CATTCATAT TCAGCAAAC GCTGATTTAA TACTTCCAAC 11520
 ATTGTTAAGT CCTTTTTTTG GCCTAATTGT AACTGCTTTA AGTAATTATT CTTTGTCTT 11580
 AAAATACGTT GGTATTGAGC TAAATCATTT AAGTAAACAG CAGAAATTTG GCCCAACTCC 11640
 40 ATATCTATAA AGCGTCGTCT TATTtGrGr GAGCCTTTA CAATATTCAA ATCTTCTGGC 11700
 GCAAATAGAA CCACATTGAG GTGTCCAATA TATTGAGTTA GACGACTTTG CTCTAAGTn 11760
 ATTCACTTTG GACTTGTTTA CCTTTnTTAG TTATAAACAT TGTTAATGGG CATCGTGCCG 11820
 45 TGT 11823

(2) INFORMATION FOR SEQ ID NO: 137:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 692 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 137:

5 ATAATTATTA ACATGGTGTG TTTAGAAGTT ATCCACGGCT GTTATTTTGG TGTATAACTT 60
 AAAAATTTAA GAAAGATGGA GTAAATTTAT GTCGGAAAAA GAAATTTGGG AAAAAGTGCT 120
 TGAAATTGCT CAAGAAAAAT TATCAGCTGT AAGTTACTCA ACTTTCCTAA AAGATACTGA 180
 10 GCTTTACACG ATTAAAGATG GTGAAGCTAT CGTATTATCG AGTATTCCTT TTAATGCAAA 240
 TTGGTTAAAT CAACAATATG CTGAAATTAT CCAAGCAATC TTATTTGATG TTGTAGGCTA 300
 TGAAGTTAAA CCTCACTTTA TTACTACTGA AGAATTAGCA AATTATAGTA ATAATGAAAC 360
 15 TGCTACTCCA AAAGAAACAA CAAAACCTTC TACTGAAACA ACTGAGGATA ATCATGTGCT 420
 TGGTAGAGAG CAATTCAATG CCCATAACAC ATTTGACACT TTTGTAATCG GACCCGGTAA 480
 CCGCTTTCCA CATGCAGCGA GTTTAGCTGT GGCCGAAGCA CCAGCCAAAG CGTACAATCC 540
 20 mTTATTTATC TATGGAGGTG TTGGtTTAGG aAAACCCAT TTAATGCATG CCATTGGTCA 600
 TCATGTTTTA GATAATAATC CAGATGCCAA AGTGATTTAC ACATCAAGTG AAAAATTCAC 660
 AAATGAATTT ATTAAATCAA TTCGTGATAA nA 692

25 (2) INFORMATION FOR SEQ ID NO: 138:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 7900 base pairs
 (B) TYPE: nucleic acid
 30 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 138:

35 ATACTGTAGC GCAAATTTCA CAATGGCATG TTATAGAAGA TTTAGTTACG AATGAATTAG 60
 GTATTAGTAT TTTACCAACA TCAATTTTCAg CAACTAAA TGGAGATGTG AAGCTGTACG 120
 CATTGAAGAT GCTCATGTAC ATTGGGAATT AGGTGTTGTT TGGAAGAAGG ATAAACAATT 180
 40 AAGTCATGCC ACAACGAAAT GGATAGAATT TTTGAAAGAC CGTTTAGGCT AACATATTAA 240
 TAAAGCACTC ATTATTTAAG GCGCATCATT ACGTGGGTCA TTGAAATAAT GAGTGTTTTT 300
 TTGTGAAAAT GAAGTGAAAT TTAGAGAGCG TTTCCATAGA AAATAGTAAT ACAAACATA 360
 45 AAAAAAGAGT ATTTTATAT TGTGTACGCC ATCTTTATAA TAGTTATTGT AACAAATTTAG 420
 ACATATTTAG AAAGGGATGG CGCCATGCAC AAAGTCCAAT TAATAATCAA ACTACTACTA 480
 50 CAACTAGGAA TCATCATGTG GATTACTTAT ATTGGCACAG AAATCAAAA GATTTTTTCAT 540

55

EP 0 786 519 A2

	ATTGTACCGC TAACTTGGGT AGAAGACGGT GCAAACCTTTT TATTAAAGAC GATGGTCTTT	660
	TTCTTCATAC CGTCAGTTGT AGGtATTATG GaTgtgCTTC CGAAATTACG CTAAATTATA	720
5	TACTCTTTTT CGCAGTCATT ATCATAGGAA CATGTATCGT TGCATTATCT TCAGGTTATA	780
	TTGCTGAAAA AATGTCyGtT AAACwTAAAC ATCGTAAAGG TGtAGACGct TATGAATGAT	840
	TACGTGCAAG CCTTATTAAAT GATTTTGTtG ACTGTcGTTT TATATTATTT CGCTAAAAGG	900
10	TTACAACAAA AATATCCGAA CCCATTTTTG AATCCAGCAT TAATTGCATC TTTAGGAATT	960
	ATTTTTGTCT TACTTATCTT TGGAATTAGT TATAACGGGT ATATGAAAGG TGGCAGTTGG	1020
	ATCAACCATA TTTTAAACGC AACGGTCGTA TGTTTAGCGT ACCCACTTTA TAAAAATAGA	1080
15	GAGAAAATTA AAGACAATGT CTCTATCATT TTTGCAAGTG TATTAAcTGG CGTCATGCTG	1140
	AAITTCATGT TAGTGTtCTT AACACTTAAA GCATTTGGCT ATTCTAAAGA CGTCATTGTA	1200
	ACGTTATTGC CCCGATCTAT AACAGCCGCA GTAGGTATCG AAGTGTcACA TGAAGTAGGT	1260
20	GGTACAGATA CGATGACCGT ACTTTTTTATT ATCACAACCG GTTTAATCGG TAGTATTTTA	1320
	GGTTCGATGT TATTAAGATT TGGAAGATTT GAATCTTCTA TCGCCAAAGG ATTAACGTAT	1380
25	GGGAATGCGT CACATGCATT TGCCACAGCT AAAGCACTAG AAATGGATAT TGAATCCGGT	1440
	GCATTTAGTT CAATTGGGAT GATTTTAACT GCAGTTATTA GTTCAGTGTT AATACCTGTT	1500
	CTAATTTTAT TATTCTATTA ATTTAGATAT TTAAAATGAT AGACAGAAAG GGAGGCTATT	1560
30	AGTAATAATG GCAAAAATAA AAGCAAATGA AGCATTAGTT AAAGCATTAC AAGCaTGGGA	1620
	TATAGATCAC TTGTATGGTA TTCCAGGAGA CTCAATCGAC GCATAGTCGA TAgtTTTACGT	1680
	ACAGTGAGAG ATCAATTTAA ATTTTATCAT GTACGTCATG AAGAAGTAGC AAGCTTAGCG	1740
35	GCTGCTGGTT ACACAAAATT AACTGGTAAA ATCGGTGTGG CATTAAGTAT CCGTGGCCCT	1800
	GGTTTAAATC ATTTATTAAA TGGTATGTAT GATGCCAAAA TGGATAATGT ACCGCAATTA	1860
	ATATTATCTG GACAAACGAA TAGTACAGCA CTTGGAACGA AAGCATTCCA AGAAACAAAT	1920
40	TTACAAAAAT TATGTGAAGA TGtAGCCGTT TATAATCACC AAATTGAAAA AGGTGACAAT	1980
	GTGTTTGAAA TCGTTAACGA AGCAATTCGT ACGGCATATG AACAAAAAGG TGtAGCTGTT	2040
	GTTATTTGTC CTAACGACTT ATTAAGTAA AAAATTAAAG ATACAACGAA TAAACCAGTA	2100
45	GATACATCAA GACCAACAGT AGTATCACCA AAATATAAAG ACATCAAAAA AGCGGTAAAA	2160
	CTAATTAATA AAAGTAAAAA GCCTGTCATG TTAATTGGTG TAGGTGCGAA ACATGCGAAA	2220
	GATGAGCTAC GTGAATTTAT TGAAATGGCT AAAATTCCTG TCATTCATTC ATTACCAGCT	2280
50	AAAACAATCT TGCCGGATGA TCATCCATAT AGTATCGGtA ACTTAGGTAA AATCGGTACC	2340

55

EP 0 786 519 A2

	CCATATGTGG ATTACTTACC TAAGAAAAAT ATTAAAGCCA TTCAAATTGA CACAAATCCT	2460
	AAAAATATCG GACATCGTTT CAATATTAAT GTAGGAATTG TTGGAGATAG TAAAATTGCG	2520
5	TTGCATCAGT TAACTGAAAA TATTAAACAT GTTGCTGAAA GACCATTCTT AAACAAAACG	2580
	TTAGAACGTA AAGCGGTTTG GGATAAATGG ATGGAACAAG ATAAAAATAA TAATAGTAAA	2640
	CCATTACGTC CAGAACGATT AATGGCATCA ATCAATAAAT TTATTAAAGA TGATGCAGTG	2700
10	ATTTACAGCAG ATGTAGGTAC AGCAACAGTT TGGTCAACTC GATACTTAAA CCTTGGTGTA	2760
	AATAACAAGT TCATCATTTT AAGTTGGTTA GGTACAATGG GTTGCGGTCT TCCAGGTGCA	2820
	ATTGCATCAA AAATTGCATA TCCAAATAGA CAAGCCATCG CAATTGCTGG TGACGGTGCA	2880
15	TTCCAAATGG TAATGCAAGA CTTGCTACA GCAGTACAAT ATGATTTACC TTAACTGTA	2940
	TTTGTACTTA ATAACAAACA GTTAGCATTT ATTAAATATG AACACAAGC AGCTGGTGAA	3000
	TTAGAATATG CAGTTGATTT TTCTGATATG GATCATGCAA AATTGCTGA GGCAGCAGGT	3060
20	GGTAAAGGTT ATACAATTAA GAGTGCTAGC GAAGTAGATG CTATAGTCGA AGAGGCATTA	3120
	GCACAAGATG TACCAACGAT TGTAGATGTA TATGTTGATC CTAATGCTGC GCCATTACCA	3180
	GGTAAATTTG TAAATGAAGA AGCGCTTGGT TATGGTAAGT GGGCATTTAG ATCAATTACT	3240
25	GAAGATAAAC ATTTAGATTT AGATCAAATT CCACCAATTT CAGTGGCAGC AAAACGTTTC	3300
	TTATACTGA TTAAAGGTT ATCACAATTG AATTGAACTA TAAAAACGGT AATTTCTATT	3360
	TCAACAAAAT GGAATTGCC GTTTTGTTTA TTTATCACA ATGATCGTAC TGAATTGATG	3420
30	ATAAAATTGT GAAAAGTTG TTGAAAACGC TTTTACAAAT ATGTATAATA GCTATGAATT	3480
	AGATATCACT TGCCTGTTAC TGGTAATGCA GGCATGAGCA AACCAACGCA CTATGAGAAT	3540
35	AGTCTTGTTT GTTCATGCCT GCTTTTTTTG TACATGGAAG CGGAAATTGA GATAGGGGAT	3600
	GTTTETATGT TTAAGAAATT GTTTGGACAA TTGCAACGTA TCGGTAAAGC ATTAATGTTA	3660
	CCTGTTGCGA TTTTACCAGC AGCTGGTATT TTATTAGCGT TTGGTAACGC AATGCACAAC	3720
40	GAACAATTAG TAGAAATTGC ACCATGGTTA AAAACGATA TCATTGTAAT GATTTCTGCG	3780
	GTCATGGAAG CAGCAGGACA AGTTGTATTT GATAACTGTC CATTATTATT TGCAGTTGGT	3840
	ACAGCACTTG GATTAGCAGG AGGAGACGGT GTTGCAAGCAT TAGCAGCGCT AGTAGGTTAC	3900
45	TTAATTATGA ATGCAACAAT GGGGAAAGTG TTGCACATTA CAATTGATGA CATTTTCTCA	3960
	TATGCCAAAG GGGCAAAAGA ATTAAGTCAA GCAGCGAAAG AACCAGCACA TGCTTTAGTA	4020
	TTAGGTATTC CAACGTTACA AACGGGTGTG TTTGGTGGTA TTATCATGGG TGCTTTAGCC	4080
50	GCATGGTGTT ACAACAAATT TTATAATATT ACACTACCAC CATTTTTAGG ATTCTTTGCA	4140

55

EP 0 786 519 A2

AGCTTTGCGT GGCCACCAAT TCAAGATGGA TTAAATAGTT TATCGAATTT CTTATTAAAT 4260
 AAAAATTTAA CATTAACAAC GTTTATATTC GGTATTATTG AACGCTCATT AATTCCATTT 4320
 5 GGTTTACATC ATATTTTCTA TTCACCGTTC TGGTTTGAAT TCGGAAGTTA TACAAATCAC 4380
 GCAGGTGAAT TGGTTCGTGG TGACCAACGT ATTTGGATGG CACAATTGAA AGATGGCGTA 4440
 CCATTTACTG CTGGTGCATT TACTACTGGT AAATATCCAT TTATGATGTT TGGTTTACCA 4500
 10 GCGGCGGCAT TTGCTATTTA TAAAAATGCA CGACCAGAAC GTAAAAAAGT CGTGGGTGGT 4560
 TTAATGTTAT CAGCAGGATT AACTGCATTT TTAAGTGGTA TCACTGAGCC ATTAGAATTT 4620
 TCATTCTTAT TTGTAGCACC AGTACTTTAT GGAATTCACG TATTATTAGC TGGTACATCA 4680
 15 TTCTTAGTAA TGCATTTATT AGGCGTTAAA ATTGGTATGA CATTCTCAGG TGGTTTCATA 4740
 GATTATATTT TATATGGTTT ATTAACTGG GATCGTTTAC ACGCATTATT AGTTATTCCA 4800
 GTCGGTATTG TATATGCTAT CGTGATTAC TTCTTATTCG ACTTTGCAAT TCGTAAGTTT 4860
 20 AAATTGAAAA CACCAGGTCG TGAAGATGAA GAAACTGAAA TTCGTAACTC TAGTGTCGCA 4920
 AAATTACCAT TTGATGTCTT AGATGCAATG GGTGGAAAAG AAAACATTAA ACATTTAGAT 4980
 GCATGTATTA CACGTCTACG CGTAGAAGTG GTTGATAAAT CAAAAGTAGA TGTAGCAGGT 5040
 25 ATTAAAGCTT TAGGCGCATC AGGTGTATTA GAAGTTGGAA ACAATATGCA AGCTATCTTT 5100
 GGTCCAAAAT CAGATCAAAT TAAACATGAT ATGGCCAAGA TTATGAGTGG TGAAATTACG 5160
 AAACCAAGTG AAACGACAGT GACTGAAGAA ATGTCAGATG AACCAGTTCA CGTAGAAGCA 5220
 30 CTTGGAACAA CAGACATCTA TGCACCAGGT ATCGGTCAAA TCATTCCATT ATCAGAAGTA 5280
 CCTGATCAAG TATTCGCTGG TAAATGATG GGTGATGGTG TTGGCTTTAT CCCTGAAAAA 5340
 35 GGTGAAATTG TAGCACC GTT TGATGGTACA GTGAAAACAA TCTTCCCTAC GAAACATGCG 5400
 ATAGGATTAG AATCTGAAAG TGGCGTCGAA GTACTTATTC ATATTGGTAT CGATACAGTG 5460
 AAAGTGAATG GTGAAGGATT CGAAAGTCTG ATTAACGTTG ATGAAAAAGT AACACAAGGT 5520
 40 CAACCATTAA TGAAAGTGAA TTAGCATAC TTGAAAGCAC ACGCACCAAG CATCGTTACA 5580
 CCAATGATTA TTACAAATCT TGAAAATAAA GAACCTGTCA TTGAAGATGT ACAAGATGCT 5640
 GATCCAGGTA AGCTAATTAT GACAGTCAAA TAATGATTAA AAATGAAACA GCATATCAAA 5700
 45 TGAATGAAT TTTAGTCATT CGTAGTGGT ATGCGAAGTA GCGAGTTGAA AGAGAATACG 5760
 TTACAAAAGG CAGTAGCTTA AAATGAAGCT ACTGCCTTTT TAGTGCGCAA TGATGTATAG 5820
 CAGGTGTGTT GATGTAAATA AGTTAAATAT TAGTGTTAGA TATAGAAAAC ATTGCTTATG 5880
 50 TTTTGTGCAC ATTTTAGAAA AATGCATCTT CGCGACTAGC CAAATTAATA GTCTCATTGA 5940

55

EP 0 786 519 A2

	AATAAAATTAA CATGATTTTA AATCTATTTG TAAGATAAGG AGATTTGTCA TTATGACAAC	6060
	AGAAGGTCTA TTAGTTGCAG AGAAAGAAAT CGAAGTGAAT GGTACGACA TTGATGCGAT	6120
5	GGGTGTCGTT AGTAATATCG TTTATATTAG ATGGTTCGAA GATTTGAGAA CAGCGTTTAT	6180
	TAATCAGCAC ATGAATTACT CAACAATGAT CAATCAAGGC ATTTACCTA TACTTATGAA	6240
	AACGGAAGCA GAGTATAAAG TACCTGTCAC AATACATGAC AAACCAGTAG GTCGTATTTA	6300
10	CTTAGTTAAA GCAAGCAAGA TGAAATGGGT GTTTCAGTTT GAAATTGTGT CCGCACATGG	6360
	CGTGCAATTGT ATTGGTACAC AGACAGGCGG TTTTACAGA TTGAGTGATA AGAAGATAAC	6420
	CTCTGTGCCA CAAGTGTTTC AAGACATTTT AGCAACAAAA TAATGACTTC ATTTTAAAAT	6480
15	ATAAAAAGTA AGAAGGTGTT CGAAATGGTT AAGCAATTAA ATAGTGTGCA AGCATTCCGT	6540
	GAATTTATTC ATCAATATCC GTTAGCAGTT GTACATGTCA TGCGCGATCA GTGTAGCGTG	6600
	TGTCATGCCG TTTTACCACA AATTGAAGAC TTGATGCAAT CATATCCCAA TGTGCCATTA	6660
20	GCTGTGATTA ATCAAAGTCA GGTGGAAGCT ATTGCTGGAG AATTAAATAT TTTCaCTGTA	6720
	CCTGTGGATT TAATTTTAT GAATGGAAAA GAAATGCATC GTCAAGGGCG TTTTATCGAT	6780
	ATGCAACGTT TTGAACATCA TCTTAAGCAA ATGAATGATA GTGTAAATAA CGATGTCGAT	6840
25	GAGCATTAAAT ATCGCAAATG ATTAGCATTG CTAAGATTAT GTAGACATCA TAACTTATTT	6900
	CCCAGTAAAT ATTGGTAGTA ATTAGAATCA GCATGGTACA GTAGAACTAT AGTAGAAATC	6960
	ATCAAAGAGG AGTGACGACA AATGCGTAAA AAATGGTCTA CACTTGCGTT TGGATTTTTA	7020
30	GTTGCAGCAT ACGCACATAT TAGAATTAAA GAAAAACGCA GTGTGAAAAG TTATATGTTA	7080
	GAACAAGGTA TACGATTATC TAGAGCTAAG CGTCGTTTTA TGTATAAAGA AGAAGCGATG	7140
	AAAGCATTAG AAAAAATGGC GCCACAGACA GCAGGCGAAT ATGAGGGAAC CAATTATCAG	7200
35	TTTAAGATGC CAGTAAAAGT GGATAAGCAC TTCGGTTCAA CCGTTTATAC CGTTAACGAT	7260
	AAAAGATA AGCATCAACG CGTTGTATTA TATGCACATG GAGGCGCATG GTTCCAAGAC	7320
40	CCACTCAAAA TTCATTTCGA ATTTATTGAT GAACTGCGAG AAACACTCAA TGCTAAAGTC	7380
	ATCATGCCAG TATATCCGAA GATTCCGCAT CAAGATTATC AAGCGACGTA TGTGCTTTTT	7440
	GAAAAGTTGT ACCATGATTT ATTGAATCAA GTAGCAGATT CTAAACAAAT CGTTGTAATG	7500
45	GGTGACTCTG CGGGCGGTCA AATTGCTTTA TCATTGCTC AATTGTTAAA AGAAAAACAT	7560
	ATTGTGCAAC CAGGACATAT TGTATTAATT TCACCAAGTT TAGATGCAAC GATGCAGCAT	7620
	CCTGAAATTC CTGACTACTT AAAGAAAGAC CCAATGGTAG GTGTGGATGG CaGTGTGTTT	7680
50	TTAGCTGAAC AATGGGCAGG GGACACACCT TTAGATAACT ACAAAGTATC ACCAATTAAT	7740

55

CCAGATGCTT TGAACCTATC GCAATTGTTG AGTGCGAAAG GTATCGAACA TGACTTTATA 7860
 CCTGGATATT ACCAATTCCA TATTTATCCA GTATTTCCGA 7900

(2) INFORMATION FOR SEQ ID NO: 139:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 1984 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 139:

GTCTAAATAA ACAAATTAT CATTGATTaC TGAACCTGGCA TTTCGAAGTA ATGCTTCAAT 60
 ATCAATCGAA TATTTCTTCA ATTTATGATT GTGAAATAAT TCTTGCATCA AAAATGGTCT 120
 TTGGTCACAT GAATGTGCAT CTGAAGCTAC AAAATGAGCC AAATTACATT CTATAAATTG 180
 TAATGATAAC TTTTGAATGT TTTTACCAAA TCCACCAACT AAAGAACTCG ATGTTAATTG 240
 ACTCAGTGCC CCATTTGCAA CCAATTCATA TAATATTTCC GGATTTTTGG CGATACTTCT 300
 ATTTCTTTCA GGATGTGCAA TGATTGGTAT GTAACCTCTC GATTGTATTT CAAAAACAA 360
 TTGTTTTGTA TAATGTGGTA CTTGCCCCGT TGGAAATTCA ATTAATAAAT ATTTGGAACG 420
 ATTAATACCT TGAATACTAC CATTATCTAA GCCTTTCAGA ATCGAATCTG TAATTCTAAT 480
 TTCTTGCCCC GGAAATAATT TAATATCCAA TGCTTGAAC TCTGGATGCG TTCTTAACTC 540
 CGCCAATTC ACAAGCACTT GTTGAAATGT ATTATCATAT CTCGGATGCA AATGATGAGG 600
 TGTCGCTACA ATACTTGTTA CACCTTCATC CTTAGCTTGC TTTAATAGTG CAATACTCTT 660
 TTCAATTGTT TTAGGACCAT CATCTATATC AACTAATATA TGGTTATGAA TATCAATCAT 720
 GATTCATCAG TCCATAATA TGCATAGTAA CTAGCACTTT TATCTTTAGG CATTCTATTT 780
 AAGACTACAC CTAATAATTT AGCACCTGTT GCTTCAATAA GTTCTTTTCC TTTTTTAACT 840
 TCATCTCTAT TATTATTTTC CGAATTAAC ACGTAGACAA CATTGCCGGT AAACCTTGAA 900
 AATAATTGCG CATCTGTAAC TGTGTTCACT GGTGGCGTAT CGATAATTAC AAAGTTATAA 960
 TTCATCAATA ATGTGTCATA CAAATTTGCA AATGCCCTTG ATGTAATTAA CTCTGACGGA 1020
 TTCGGTGGGA TTGGCCCAGA CGTCAAGACG TCTAAATCTT GAATTTCACT TGAGATAATA 1080
 CTGTCTTGAT AAGTTGACCA ATTTAGCAAT AAACCTTGATA GGCCTTCATT GTTTGGCAAA 1140
 TTAAAAATAT AATGCTGCGT AGGTTTACGC ATATCCCCGT CTACGATTAG TGTTTTATAA 1200
 CCTGCTTGCG CATATGCAAC TGCTAAATTT GCTGCAATTG TAGACTTACC TGCGCCTGGT 1260

5 GATCTTATGC CTCGAAATTT CTCGCTAATA GGTGACTTTG GTTGTTTCATG GACAATTAAA 1380
 CTTGATGTAC TTCyTCGTGT ATTCGTCATG GTAATTCCTC GTAAATTAAA ATTTTGTAT 1440
 TGAACCTAAA ATAGGTAATC CTAGTTGCGA TTCAACATCT TCTTCTGTCT TAATACGCTT 1500
 ATCTAATAAT TCTTTTAAGA AAATAATCAA TATTGCTAAA ACAATACCAA CAATAATGCT 1560
 10 GATAACTAAG TTGACAGATA CTATTGGAGA TACTTTTACA GCATTATCAT GTGCTGAGGA 1620
 AAGTATCGTA ACATTATCAA CACTCATAAT TTTAGGCATG TCATGAGCAA AAACCTTAGA 1680
 TATTTTATTA ACAATTTTGT CAGATTGAGA TTTATTCCCA GTGGTAACTG ATACAGTAAT 1740
 AATTGAGAG TTTGTTTGAT TGGTTACTTT TAAAAATGAA TTCAACTCAG CTGTTGAATA 1800
 15 CTGACCATCA AATTCTCTAG ATACTTTATC TAGAATTCTA GGACTTTTGA TAATTTCCGT 1860
 ATATGTATTA ACAGACTGCA AACTACTTTG AACATTTTGG AAAGCTAAAT CACTTGAGGA 1920
 20 CTTTTTCATG TTCACTAATA TTTGAGTAGA AGCAGTATAT TTGTCAGGCA TAACAAAAAA 1980
 GGT 1984

(2) INFORMATION FOR SEQ ID NO: 140:

25 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6272 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 140:

CAAATCCCTT GGTGATGATA AAtGtATTGC TGTGTAGCCA AATAATCTTC GTATATATGA 60
 35 CTGACGTTCA ACAACAGCTT GCAATCGTTT CGTTGGTACA GTTACTTTCT TCTTGTTAAA 120
 GAGACCATAT TCAATTTTAA GTTGCTCATT TTCAAGCATC ACCGAAAAGC CATAAAATCT 180
 TATCATTGTT ATAATCGTTC CAATAATATA TGCCACTATT AATACTAGTA AAATGATGAT 240
 40 TAATACTGAA ATACTTACAA TTTGAACCCA TTGACTAATT TCATGATTTA GCTTCGACCA 300
 TGGGATCAAC TCTCTTACAG CCCCCTAAAT CGGTACTAAA GCTGCTAACG TTACACCAAT 360
 GCGCCACTG GTCATTGCCA TAAATAGTGA TTCTTTAAAA TTCATCTGAT ATATAGGAAT 420
 45 GCGTTTATTT TTCTGATTAA GCATACTATC AGTGTCTGTC ACTTCATCTA AGCGACCTTC 480
 TCGATGTCT TCCACATTAC CTTCAATGTC ATGATTACAG TTGTCATTCT TCTCAGCACT 540
 AGACTTTTGC GCCACTTCTG TCTTCAACTC TGTTTGCAAT TGATCAATAT ATCGTTCAAG 600
 50 ATATTCACCT TGTTTTTTTCG AAATAACACT TAAGACAATA CCATCACTTG GTGTTTTGAT 660

55

EP 0 786 519 A2

	AATACGTTTT ATATTTAATT CTTTACGCTT TTTATTAAAA ATACCTGTTG TTAAAATGAA	780
	ATAATTATCC tCAATCCAAT ATCGCGTGTT CATAATTCCG ACAATTTGAG AAATGTATGA	840
5	TATTAAAAAG AATACAAATA CAATACCTAT CCATAAATAT GATTCCGGGAT TCGTATAATC	900
	AAAATCTTTC AATTGAAAGA TAATGAAAT AAAAAAGACG ACTATGTTTT GTTTGATAGC	960
10	ATTGATTATG CCATTAAAT ATGAAATCGG ATGTAATTTT TGAGGTTGAG ACATCACTTT	1020
	CAACCCCTCT CAAATTGAC ATAGTTCTCT CTTGATTAT TTTAACATCG TCATGAGACA	1080
	TCATCGGTAA ATAAATAGTA TGACCTGCAG TCATAATCC AACTTTATAC AAATTAAGCA	1140
15	CTTTACTAAT TGGATTAGAT TTAATCGACA AGTATTGTAA ACGTTCAATT CGACTCGTTT	1200
	CTTCTTTATA TATAAAAAAT GATGTACGAT ATTGTACACT TAGTTGATCA ACTTTATAAA	1260
	AGCGACAATG ATATTGCCAT AAAGGCTTAA TAAATAATTT TAATGTACTC AGAGCACCTA	1320
20	AAACCAACAA AATATAAAGT AAGTAATGTG GCCATTCAAA TCTTAACCAT ATAAAAATAA	1380
	AAATGACATA CACAGCTACA CTCAATATAA ATTCTAAGCC ATTCGTAATG TAGTAATACA	1440
	ACAATGCTGA CTTAGGACTC TTAGTCAACT TAGTATAATC TGACATATAC CCCTCTCCCC	1500
25	AAATAAAAAA TTATACGGAT TTATAATCTA TTTTATTTTA TTTTATATG ATGATAATTA	1560
	TAGCATATGG AATATTTTAT GCTAATTTAT TCTTCCTAAA GGTACATCTA AAAATTTAAT	1620
30	TAAGCAGAAA GTGCTTGAAT TGCTAAAAAG ACACCATGTT ATAATTTTAT CAACATGATG	1680
	CCTTTTCTCT ATAATCAATC TTTTATCTTA TCAAGAGCGA TATTTAGTTC AAGCACATTC	1740
	ACATAATCAT TTGTTAACAC ACCACGCTGC TTACGATGTT GAATCAAGTC GGCCACTCTT	1800
35	GAAGTAGATA CATGACGAGC ATCAGCAATA CGAGGTGCTT GCTTCAATGC ATTTTCGACC	1860
	GTAATATGCG GATCTAAGCC CGACCCAGAA CTTGTTGACG CATCTATTGT TACATTTGAA	1920
	TTCCCAAATT TAACATGATG TTTTATGCGT GCTATTAATT CGGTGTTTCC ATTCGATTCA	1980
40	TTACTTCCAC CTGAAGATAC GCCGTTTTTA TATAATTTTT CAGGATTCAT ATTATAATCA	2040
	ACTGCACTCG GTCTCCCGTG AAAATATCGT GTCTGTGTCC AGTGCTGTCC AATCAATTTT	2100
	GATCCAATA TACGATTGTC ATACGTAATT AACTGCCAT TTGCTTGTTG ATAAAAAAT	2160
45	ATTTGACCAA TTAACGTGAT AGCTAACGGG AATAAAAAATC CACATAATAC CATAGTTATT	2220
	ATCGTTAAAC AAATACTATT TCTTATCGTA TTCATGGTAC AGGCTCCTTC CTCTTTACAC	2280
50	AAAAAATTGT ACAATCATAT CTATTAATTT AATGCCTAAA AACGGGACGA TTAATCCACC	2340
	TAATCCATAA ATCAACATAT TATTTATAAA GATTCTATCA ATGCTGTAAC CCTTTACTTT	2400
55	TACACCTTTC ATGGCAATTG GAATTAAGGC AACAATGATT AATGCATTGA ATATCAAAGC	2460

AATTGTTGAC ATCATTAGTG CAGGTAAAAT TGCAAAGTAT TTTGCTACGT CATTAGCCAA 2580
 ACTAAATGTC GTTAATGCAC CTCTCGTCAT TAATAATTGT TTGCCTATTT TTACAACCTC 2640
 5 TATTAACTTT GTAGGATTCG AATCTAAATC AATTAGATTA GCTGCCTCTT TAGCACTAAT 2700
 TGTCCCTGAG TTCATAGCTA ATCCTATATT CGCTTtGTGc tAGCGCAGGT GCATCATTTG 2760
 10 TACCATCTCC TGTCATCGCA ACAATATGGC CTTTCGCTTG TTCATCTTTG ATGACTTTAA 2820
 TTTTATCTTC GGGTTTACAC TCTGCAACAA ATCTATCAAC CCCGGCTTCT TTTGCAATTG 2880
 TAGCTGCTGT TAAAGCATTa TCACCTGTAC ACATAACTGT TTCAATCCCC ATTTTCTCA 2940
 15 ATTCAGTAAA TCGTTCTACA AGACCATCTT TAATCACATC TTTTAAATAA ATCAGGCCAA 3000
 GCATGACATT GTTTTCAATG ACTATTAAATG GnGTGCCACC TTTACTCGAT ACATCCATAC 3060
 AGAGAGACTC AATATTAAGA GGAATATTGC CTTGTTGTTG TTTGACAAGA TTTATCATAC 3120
 20 TATTAGGTGC ACCTTTGAAT ACCGATATTT CATTGTGAAT GATTCCGCTC ATTCTAGTTT 3180
 CAGCTGTAAA AGGCTTATAT GTGCCATCAA TGTCTTTAGG CAGCTCATTT ATATACATcT 3240
 GcttCGCTAA TCGTACAATA CTTTTTCCTT CTGGCGTATC ATCGTAGATT GATGACATAT 3300
 25 AAGCAGCGAC TATCAATTTT TCAAGCATTT GTTGATTAC TGGTAAAAAT TCACTAGCGA 3360
 TTCGATTGCC ATAAGTGATT GTGCCTGTCT TGTCTAAAAT CATTACATCG ACATCTCCAC 3420
 ATACTTCTAC AGCAGGCCCA CTTTTCGCTA ATACATTGAA TTGAGTAACA CGATCCATGC 3480
 30 CTGCAATACC AATCGCCGAT AACAAACCAC CGATTGTCTG TGGTATTAAA CATACTGTTA 3540
 ACGCAATGAG CATCGCAATA GGTAAAATTA AATGCAGGTA AGATGCTATT GGATATAACG 3600
 35 TTACAATAAC GACTAAAAAT ATAATTGTTA ACGTTGTAA TAATGTAAAA AGTGCAATTT 3660
 CATTTGGTGT TTTATTTCTT TCCGCCCTT CAACTAAGGC AATCATTTTA TCTAAAAAG 3720
 ATGTACnCGC TTCACTCTCA ACACGTATTT CTAACCAATC AGATGTTACA AGTGTAACGC 3780
 40 CAATGACTCC ATCAAAATCG CCACCTGATT CTTTATCAC AGGTGCAGAC TCACCAGTAA 3840
 TTGCAGATTC ATCAACGGTT GCTAATCCAT TTATTACAAC GCCATCAGCA GGGATTGTTT 3900
 CTCCATTTTC TACCGAATA TTTTGTCCGG CTTTAACTC TGTGGCGTTC ACTATCCGAT 3960
 45 ACGCACCATT TTCTTCTATC AATCGAGCAG TTAAATTTGA TTGTGCTTGT CTTAAACTAT 4020
 CAGCTTGCGC TTTTCACGA CCTTCAGCAA AGGCTTCTGA AAAATTAGCA AACAAATAG 4080
 50 TTATTAATAA TATGATAAAA ATTGTAATCA AATAACCTCG CGATAGATAG CTAGTTCCAA 4140
 ATATGTCAGG AAAACATATT AATATCAACG TTAAATCAT TCCAACCTCA ACGACAAACA 4200
 TTATCGGATT TTTTATTAAT TGTTTAAGAT TCAGCTTATA AAAACTCATT TTCAAAGCTT 4260

55

TTTATTTTAA AGTTAAAAAT TCACCAATAG GACCAAGTAA TAGTACTGGA ATAAATGTCA 4380
 AACCACCTTAG TAAAACGATA AATACGATTA GTGATACGCC AAAATAAGGT TTATCAATCG 4440
 5 CTATTGTATA TTTATCTTGA TGGTATGATT TTTTATTAC TAAACTTGAT GCAATCATT 4500
 ATTGCAAAAT AATTGGTATA TAACGAGAAA GCAACATAAT GATTCCCTGTA GAGATATTCC 4560
 10 AGAATGTTGT ATCATCTTTC AGTCCTTCAA ACCCTGATCC ATTGTTGCA GCAGCTGATG 4620
 TCATTTCATA CATAACTTGT GAAATACCAT GAAAAGACGG ATTCTGtATa CTTtCACTTG 4680
 CTCCAGGAAT CATAAAAGCA AGTGCTGAAA ATACTAAAAT TAAAATTGGG TGTATGAGAA 4740
 15 AGACTAAGAC AATACATTTT ATTTACGGG CGCCAATTGG CATATTTAAA TATTCTGGTG 4800
 TTTTACCAAC CATCAAACTG CATATAAACA CCGTCAGTAA GACAAATATC AATAAATTCA 4860
 TGAGTCCTAC GCCTTCGCCA CCAAATACAA CATTTAGCAT CATTAAATACC ATTGGTCCTA 4920
 20 ATCCACCTAT AGGCGTTAAG CTATCATGCA TGTTATTAA AGAACCCGTT GTAAATGCCG 4980
 TCGTAATAAC TGTAATAGT GCTGACAAAC CTGCTCCAAA CCGTACCTCT TTACCTTCCA 5040
 TATTCCGTCC ATAAATGCCT AAATTCGCTA GTATTGGATT ACCACGATAC TCACTCCACA 5100
 25 TAGTTAATGT AAGAATTGCT ATAAAAATGA AAAACATTGC GACAAATAAT ATCAACGCAT 5160
 GACGATGTAC TCGTTTACCA TGTCTACTTA ACATGCGACC AAATAAGAAC AACATTGACA 5220
 TAGGAAGTAA CATCATACTG CCCATTTCTA TAAAATTGCT CCAAATATTT GGATTTTCAA 5280
 30 AAGGTGTTGC AGAATTTCTT GCTAAAAATC CTCCACCATT CGTACCAAGA TGTTTTATTG 5340
 ATTCAAGTGA TGCAATAGGT CCAAATGCAA TATGTTGAAT ATGTCCGCTT AAAGTCCGAA 5400
 35 TCATTAAATT AGCATGCAAC GTTTGTGGTA CaCCTTGAGT CATCAATAAA ATACTAATTA 5460
 AACATGATAA TGGTAAAAGT ACTCGGACAA TAAACCGAAC AATATCTTGA TAAAAATTAC 5520
 CAATGATATT AGTTAATCCA GTTAAACGTC TCAACATCGC TATACAAACG GCGTAACCTG 5580
 40 ATGCACTAGA TGTAACATT AAATATGTCA TTACAATCAT TTGCGTTAAA TATGTCACAT 5640
 CTGaTTCACC GTTATAGTGT TGtAAATTAC TATTTGTAA AAAAGATATT GCTGTATTAA 5700
 ACGCTAAATC TATCGATTGG TTTAAATTAT GATTTGGATT TAAAAAAGC CATTGCTGAA 5760
 45 CTATTAGCAA TACAAATGTT ATAAACCCCA TAAATCCATT AAATGCCAGA AAATGTTTGA 5820
 CATATGTTTT AGCTGACATG TGTTCTAAAT CTGTGCCGAT AATTTTAAAA CACATATTTT 5880
 CAAATCTAGT AAATATTAAA TCTACTCTTG ACGATTGCAC CAATGCTACG CGATATAGAT 5940
 50 ATCCACTAAA AACATACGTA ATCATAACCA TCATTGTTAG AAACAAAATT ATTTCCATGA 6000
 TAACCCTCAC TTAATATATT TCTAAAATTT TTCCTACGA ATTAAGGCAT AAAATAAATA 6060

55

ACACAACAAC ATCGTAACAA CTTGTTTATG AGAGAAATnT TAATTTTCAA ACTTAGTTAT 6180
 TAAGAAAnCA TTAAGATGTG TATGCAGAAA TAAATTTTAT AGCATTTAAT TGTGAAGAAT 6240
 5 ATTATGATAT TGCTATCGAG GTGAAGGTTA TG 6272

(2) INFORMATION FOR SEQ ID NO: 141:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1978 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 141:

AAATGATGTT TTACAATAAA TATAnAAACG TATCAACATA TATCATCATA TTTTtagTTT 60
 20 CAAGTGCAGC CTTTGCAATA TTCTTGTTAA GTGCGnACAT TAGTGCTCAC TCGGAACAAG 120
 TGTACGAAAT GACTGACCAT CAAATTAAGA ACAATACGAT AAATAAAGCA TACGAACATA 180
 AAGACCCTAC AAACAATAGC GAACAAAGAG ATGGGAAAGT GTTCGCTTTA ATAAATTGAT 240
 25 ACATTGTCAC AACGTTATTT TGCCTATTTT TGCGmAATAG CGTTTTTTAT TACwTTTTTG 300
 CTGATstTAA ATTTGTTATA TTTTGTTAAA GTATTATAAT GATTGAATAA ACAAAATGAA 360
 GGTAGGTTTT TTAATTGAGT AATTCTGATT TGAATATCGA AAGAATTAAC GAGTTAGCTA 420
 30 AAAAGAAAAA AGAAGTAGGA TTAActCAAG AAGAAGCAAA GGAGCAAACA GCCTTAAGaA 480
 AAGCTTATCT TGAGAGTTTT AGAAAAGGGT TTAAACAACA AATTGaaaAT ACTAAAGTAA 540
 TTGATCCAGr AGGTAATGAT GTAACACCTG AAAAAATTAA AGAGATACAA CAAAAAGAG 600
 35 ATAATAAAAA TTAAATCACA AATCTGTAAA GAATTTTCTG ACATTATAAC TTGAAATAAG 660
 TATTTTACTT ATCTTTTTAT TTTAAAATAA GTTATAATGT ATTTGATAAA ATTGAAGAAG 720
 40 GGAAGATACA CAAGATGTTT AATGAAAAAG ATCAATTAGC TGTTGATACG CTACGTGCAC 780
 TAAGTATCGA CACAATCGAA AAAGCGAATT CTGGTCATCC AGGATTACCT ATGGGAGCTG 840
 CCCCAATGGC TTACACTTTG TGGACACGTC ATCTGAATTt TAATCCACAA TCTAAAGATT 900
 45 ACTTCAATAG AGACCGTTTT GTATTATCTG CAGGGCATGG TTCAGCATTa TTGTATAGCT 960
 TGTTACATGT TTCTGGTAGT TTAGAATTAG AAGAATTAAA GCAATTTAGA CAATGGGGTT 1020
 CTAaaACACC AGGTCATCCT GAATACAGAC ATACAGATGG TGTagAAGTT ACTACCGGAC 1080
 50 CACTTGGACA AGGTTTTGCT ATGTCAGTAG GATTAGCTTT ACAGAAGATC ACCTAGCAGG 1140
 gAAATTTAAT AAAGAAGGAT ATAATGTTGT AGATCATTAC ACATATGTAT TAGCTtCTGA 1200

AAGTAAATTA GTTGTTTTAT ACGATTCAAA TGATATTTCA TTAGATGGCG AATTAAACAA 1320
 AGCTTTTTCT GAAAACACAA AAGCTCGTTT TGAAGCATAT GGTTGGAATT ACTTACTAGT 1380
 5 TAAAGATGGT AATGATTTAG AAGAAATTGA TAAAGCGATT ACTACAGCTA AATCTCAAGA 1440
 AGGACCAACG ATTATTGAAG TTAACAAC AATCGGATTT GGTTCCACCGA ATAAAGCAGG 1500
 AACTAATGGT GTTCATGGGG CACCTTTAGG TGAAGTTGAA AGAAAATTAA CATTGCAAAA 1560
 10 TTACGGTTTA GATCCTGAAA AACGTTTTAA TGTTTCAGAA GAGGTATACG AAATTTTCCA 1620
 AAATACTATG TTAACAACGTG CTAATGAAGA TGAATCTCAA TGAATTCAT TATTAGAAAA 1680
 ATATGCAGAA ACATATCCTG AATTAGCAGA AGAATTTAAA TTAGCGATTA GTGGTAAATT 1740
 15 GCCTAAAAAT TATAAGGATG AATTACCACG TTTTGAACGT GGTCATAATG GTGCATCTCG 1800
 TGCTGATTCT GGTACTGTTA TTCAAGCAAT CAGTAAACT GTCCCTTCAT TCTTTGGTGG 1860
 20 ATCAGCAGAC CTTGCTGGTT CAAACAAATC CAATGTAAAT GATGCAACTG ATTATAGTTC 1920
 TGAAACACCT GAAGGtAAAA ATGTGTGGTT TGGTGTACGT GAATTTGCTA TGGGTGCT 1978

(2) INFORMATION FOR SEQ ID NO: 142:

25 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 7588 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 142:

TAGTAGTATT TATTAAATTA TACGAAGGGA CCcAACACAG AAAATTCATT TTATTGAATT 60
 35 TTACATTTAT GTGCCAAGTT GGGAAAAATG TCTTATTTT TCaAAGTATT TAAAAGTAAA 120
 ATTACATGTT AATACGTAGT ATTAATGGCG AGACTCCTGA GGGAGCAGTG CCAGTCGAAG 180
 40 ACCGAGGCTG AGACGGCACC CTAGGAAAGC GAAGCCATTC AATACGAAGT ATTGTATAAA 240
 TAGAGAACAG CAGTAAGATA TTTTCTAATT GAAAATTATC TTAGTGCTGT TTTTtagGGA 300
 TTTATGTCCC AACCTTTTTA GAATATTAAA TTTCTACAAT TTCGTCTCT TCAACAATAA 360
 45 AGCCCATTGT ATTGACGCTG TTATTTAAGA AAGTCAGAAT ATAACGCATT ACTTCATCAC 420
 GTTCTGGCTC ATTGTGAACC TCGTGGTAAA AACCTTGCCA AGCTTTAAAA TATAATTCAG 480
 GTGTTTGATA TTTTCTTTA AACTCATCAA TTGCCCTAGT ATCAACAATT AAATCCTTCG 540
 50 TTCCATACAT TAATAGCGTT GGCATTGGTT GAATGTCATG AATATGAGCC ATCGTATCTT 600
 TCATCGTCTC ATTAATTGTA TTATACCAAT GATACGTTGC TTTTTTTAAC ATTAAACCAT 660

55

EP 0 786 519 A2

	CATTAAACG TGTGTCTTTT GAAATTTTAC CTATATTTGA AACAAAGTTTA TCTTTACGAT	780
	TTTTTCCATT CTTTGAAGT TCTAGCATAG GAGAAATTAA CATCATCCCC TCGATTGGCA	840
5	ATTCTACTTT TTCAAGTAAA TTTAATAAAA TCAAACCGCC AAGTCCTACC CCTAATACAT	900
	AAGTAGGAAT TTTATATTCA TTAGCTATCT TTAACCAGTC TAGCAAACCT TCGTGATACG	960
	TTTGAAAGTT TTCAATTTGT CCTTTATTAG CTCTTGAAGT TTGACCTTGA CCAGGCAAAT	1020
10	CTCCCATAAAT CACATGATAG CCATTTCTTC TTAACATCGT AATAACATAT GCATATCTTC	1080
	CCGTATGTTT TAATATATTA TGAGCAATAA CAACGACGCC TTTCGCATCA TTTTCAGCTT	1140
	CCCACITCCA CATTATTATA CTGCCCCTTT TTCATTAATC TTCAATAACA TAATTATAGC	1200
15	AAATTCACTA TGTAGATTTT TATTTATAGT ATTATTGTTG TCCATATTAT TATATATAAA	1260
	TGAAATCAAC ATCAATAATA GTGTAATTAT ACATAATTAT TTTTGATTGT TTTTGATGAA	1320
20	AACGCTTTCT CGAATATTTT TTTCATGCTA AACTTATTGT AAACACAAGG GTTTGGAGGA	1380
	GTAGCAATGG CACTATTAAA GAATTTTTTT ATCGGATTAT CTAATAATAG TTTTTTAAAC	1440
	AACGCAGCAA AAAAAGTGGG CCCACGTTTG GGCGCCAATA AAGTCGTTGC CGGAAATACA	1500
25	ATTCCAGAGT TAATTAATAC AATCGAATAC TTAATGACA AGAATATCGC TGTTACGGTA	1560
	GACAATTTAG GGGAAATTTG CGGTACAGTT GAAGAAAGTA ATCATGCTAA AGAACAAATT	1620
	TTAACAATTA TGGACGCGCT TCATCAACAT GCGGTAAAGG CACATATGTC TGTTAAATTG	1680
30	AGTCAGTTAG GTGCAGAATT CGACTTAGAA TTAGCTTACC AAAATTTAAG AGAGATTTTA	1740
	CTTAAAGCAA ATACTTACAA CAATATGCAT ATAAATATTG ATACTGAAAA ATATGCTAGC	1800
	CTGCAACAAA TTGTTCAAGT TTTAGATCGC TTAAGAGCG AATTTAGAAA TGTTGGTACT	1860
35	GTAATTCAAG CATATTTATA CGATAGCCAC GAATTAGTTG ATAAGTACCA AGATTTACGA	1920
	TTACGTTTGG TTAAAGGTGC ATATAAGAA AACGAATCAA TTGCATTTCA ATCTAAGGAA	1980
40	GACGTAGATG CAAATTACAT CAAAATAATT GAACAACGTT TGTTAAACGC ACGCAATTC	2040
	ACTTCAATTG CAACACATGA CCATCGCATC ATTAATCATG TAAAACAATT TATGAAAGAA	2100
	AATCACATTG AAAAAGATCG TATGGAATTC CAAATGCTCT ATGGTTTTAG ATCAGAGTTA	2160
45	GCAGAAGAAA TCGCAAATGA AGGCTATAAT TTCACTATTT ATGTACCTTA TGGCGATGAT	2220
	TGGTTTGCCT ATTTTATGAG AAGATTAGCA GAACGCCCAC AAAACCTATC TCTTGCTGTA	2280
	AAAGAATTTG TGAAACCTGC TGGCTTAAAA CGTGTGGCA TAATTGCAGC TTTAGGAGCT	2340
50	ACAGTTATGT TAGGTTTAAG TACAATTAAA AAATTATGCC GTAAATAGAG CAAGACATAA	2400
	ACAATAATTT AGGAGTCTGG AACAAATATC AATGTTCTAG GCTCCTAAAT GTTATATTGG	2460

55

EP 0 786 519 A2

TAGATTTTAA TAAATTAGCC ATTTCAATTG CACTTACTGC TGCTTCAGCA CCTTTATTGC 2580
 CAGCTTTCGT ACCTGCTCTT TCCACAGCTT GTTCAATACT TTCAGTCGTT AAAATACCAA 2640
 5 ATATGACTGG TACATTAGTT TGATCATTCA CTTTAGAAAC ACCTTTCGCG ACTTCATTAC 2700
 AAACATAATC ATAATGAGAC GTAGCACCGC GAATTACGCA TCCTAATGTA ATTACTGCAT 2760
 CATAATTTCC TGATGAGGCT AATTTTITAG CTACTAAAGG AATTTCAAAC GCACCTGGCA 2820
 10 CAAATGCTAC ATCAATATTG TCTTCATTAA CATCATGTCG AATCAAAGTA TCTTTTGCAC 2880
 CTTCAAGTAA TCTTCCAGTG ATAAAATCAT TAAATCGACT AACTACGATT GCAACTTTCA 2940
 AATCTTTTCC AATTAATTTA CCTTCAAAAT TCATGTAAA ATCCTCCTAT ATTAAATGAC 3000
 15 CCATTTTTAT TTTTTCGTT TCCATATAAT CATGATTATG TACCGTTTCT GGTACGATAA 3060
 CTTCAATTCT TTCTGCAATA TCAATGCCAT ATTGTTTTAA TCCCTCAAAT TTAATTGGAT 3120
 TATTACTTAA TAAATTGATA TGTTCGATGT TAAAATATTT TAAAATCTGT GCAGCAATAT 3180
 20 GATAATCTCG CAAATCTTCA TCAAAACCTA ATGCTAAATT TGCAGTTACT GTATCATATC 3240
 CTTGCTCAAT TAATTCATAT GCGCGTAATT TGTTTAACAA TCCTATGCCA CGACCTTCTT 3300
 25 GAGGTAGATA AATAATCATG CCACCATGTT CATTGATATA CTTCATAGAC GATTCAAGTT 3360
 GAGCACCACA ATCACAACGT TGAATATGGA AAATATCGCC TGTAAGgCAC GCAGAATGTA 3420
 AGCGTACATT TTCATGTTGT CGAATTGCAC CTTTTGTCAG TACAACTATC TCTTCATCTG 3480
 30 TGTATGTCGC TTTAAAACCA TACATATCAA ATGTTCCGAA ATCTGTAGGC ATTTTCACCT 3540
 TTGCCTTAAA TTCAATTTCT GGTCTAATT TTTTACGATA TTCAATTAAA TCATCAATCG 3600
 TAATCATCTT TAATTGATGT TTTTCTTTAA ACTTTTGTA ATCTTGTCCT TTCGCCATCG 3660
 35 TGCCGTCATC ATTCATAATC TCACAAATGA CACCAGCGGG CTTGGCACCA GTAAGTTTAG 3720
 CTAATCAAC AGCCGCTTCT GTGTGTCCAT TTCTAGCTAA TACGCCTTTA TCTTGTGCTA 3780
 CTAATGGAAA TAAATGACCA GGACGATTAA AATCTTTAGC TTCACTACTA GGATCAATGA 3840
 40 GCTTTTTGGC AGTCAATGTA CGTTCATAAG CACTAATTCC TGTTGTTGTA TCTACATGAT 3900
 CAATACTCAC TGTAATTGC GTACCAAAGA TGTCGGAGTT ATCATCAACC ATTTGTACCA 3960
 AATCCAAACG TTGTGCAATA TCTTTAGACA CTGGTGCACA TATTAATCCC CtTGCTTCTT 4020
 TCGCCATAAA ATTAATGGTA TTATCGTTCA TCCATTCACT AACCGCTACT AAATCACCTT 4080
 CATTTTCACG ATTCTCATCA TCTACTACAA TAATTGGTTC TCCATTTTTT AAAGCCATTA 4140
 50 AAGCACTGTC AATATTATCG AATTGCATGC TACCCCTCCT AAAAACCAAA TGCTCTTAAT 4200
 TTATCTACAG ATAATTGGTC TTTATCTTTA TTTAAATAT TTTCAACATA TTTAAACAAA 4260

55

EP 0 786 519 A2

	CTCGTTTCTG GAATAAGATG AATGTCAAAA CTGTTATCAT GCTTATCAAA TACCGTTAGA	4380
	CTAACACCAT CCACAGTAAT AGACCCTTGC TTAACATACT GATTATTAAT ATGTTGGCTA	4440
5	CATTGAATCG TAATAATTTT TGCATTGGCT GTTTCATTTA TTTTGAAC TGTTCCTAGT	4500
	TCATCTACAT GACCGAGGAC AAAATGTCCA CCAAACCTAC CGTTACCACT CATGGCAGCG	4560
	TCTAAATTTA CTTCTGATTG TCGCTTAACA TCTGCTAAAT AGGTTTTATT TTCAGTGCCT	4620
10	TTAATTACTT GAACAGTAAA AGATGTCTGA TTAATACTAA TCACTGTAA ACATGCACCA	4680
	TTAACTCTGA TGGAATCACC AATATGCATA TCTGCCGTAA TCTTATGTGC TTCAATTTCA	4740
	ATCGTCTCTGA CTGATTGACG AATTGGAACA CTTTAAACGA CACCTATTTT TCACACGATG	4800
15	CCAGTAAACA TGCATCATCA CTTCTTTCGT AAAGTTAATT TAACATTTTG ATTTAATAAC	4860
	TCGGAATGAA CAATTTCAAA TTGGTTCGCA TCTGGTATCT CAATCACATC ATTTGTTTGA	4920
20	TAAAATTGAT AATTTCCAGA TCCGCCAATT AATTTCCGGG CATAATAGAG AATAAATTCA	4980
	TCTATATAAT TAGATTGGAG AAATCTGAA GTAGTGGTTG GACCTGCCTC GACTAGCAAA	5040
	GTTCCAATCT CTCTTTTATA TAAATTGTGA AGAATTGTTG TTAAATCGCA AGACTTCAAG	5100
25	TAAATAATTT CAATATGTGT TTGATTGTTT GTTAAATTTG GATTTTCAGT ATATATCCAA	5160
	ATTGGTGTG ATTCACTCTG ATAAATTGTC TGATTAAAAT GAATATTCCC AGACTTAGAC	5220
	AATATTACTT TTATAGGGTT TTTTCCATCT TGAATACGTG TAGTATATTG TGGATCATCT	5280
30	AATCAACTG TACGTCTTCC AGTTAACTACT GCGTCGTGTC GATGTCTTAA CTTATAGACA	5340
	TCTTGTTTAA CCTCTTTGTT AGTAATCCAT TGACTTTGTC CATTATCATT CGCTTGTTTA	5400
	CCATCTAAAC TTGCAGATAC TTTCACTGTA ATTTGTGGCA GTTGCTTTGC TTTTGCTTTA	5460
35	AAAAAGTCTT GGTATAATTG TGATGCCCGT TCATCATCAA CGCATTCAAC CTCAATACCG	5520
	TGAGCCCGTA ACGTCTCATC ACCATGTGTG TCTAACGAAT TGTCTTTTGT TGCCTATACT	5580
40	ACTTTTGCTA TCTTACAATC AATTATTTTG TTAACACAGG GTGGTGTGA ACCAAAATGA	5640
	CTACATGGCT CTAACGTAAT ATAAATCGTC GCACCTTCAG CATTTTGTG TGCCATATCA	5700
	AGTGCTTGAA CCTCCGCATG CTTGTACCT TTTCTCAAGT GTGCACCAAT ACCAACAATC	5760
45	CTACCTTCTT TAACTACAAC AGCGCCAACG GGTGGATTAA CACCTGTTTG ACCTTGTAAC	5820
	ATATTTGCAA GTTGAATCGC ATAATCCATA AATTGACTCA AATGATCACC TCTATAACA	5880
	AAAATCCTCA CATCATGAAT TAAGATGCAA GGAGAAAAAT TTATCGTTAA ATAAGCCTAT	5940
50	TTGTACACAT TTTTACAAAT ACGCTACATT ATCTTTGTG ATAATTAACA TTCTTTCTCC	6000
	CATCCAGACT TTAAGTGTG GCTCTAGAAT CTCCTAGAT CAGCCACTAA TATGAAACAT	6060

55

EP 0 786 519 A2

TTaTATATGA AATTGTTATA GATTATTTGA GTACGTAGTA TGTCAACTAC ATTTAAAATG 6180
 AACTATATATG TTTTCTGAAA AAACAATTAA TGACGGTTTT AATTTAATAT AATCTGAGTA 6240
 5 CTATAGGCAT CTCATTGATA TGATTCTTAC TAACAGACAT TAAAATCAAA CCTTCAATTC 6300
 GTCTCTATAG AGCGTTCTCT TTATTATCTT CTAGTTACAA ATTATTGATT GtCACtGCGC 6360
 TGTGTTGCT CATTCGATTC TAAAGCATCA TATAATTGAG ATACTGTATG CGCAACTTGT 6420
 10 TCTACAATCA TTTTCACACC GTTTCGTAGT TTATTAACAC CGTTTGTCAT TTGACCTATC 6480
 GCAATCATAT TTGTTAATGT TCCAAACCTT GGACTAATAA CTTGATTGGT TTCCGGAATG 6540
 ATTTGTATGC CTCCCATTGG GTGTGCTTGT ACAATTTGTC TATTTTCAAG ATTTCTAATT 6600
 15 AATTGATCAT CTTGATCCAA TTCATTTAA TGACTTTTTG CACCTGTGCG GTTAATGACA 6660
 ACATTATATA TGTCTACTGA TTCTTGGTTT TTGTATGAAA AATAATACAA CTTGCCATaC 6720
 ATGTTACAT CTCTAAATC TTTTTTCAAA ATTAAAGACT TATTTTCTAT TAATTCAATA 6780
 20 ATTAGTTCAG CAGTTCTTGG AGGCATTGGA TTTGAATTA ATTGAATCAT CTTTGAGTAT 6840
 TTTTGATTAA ATTGATGTTG GTCTTCAATA CTTAAGCTAT TCCATATCCA ATTTAAATTC 6900
 25 TCTTTCAAAT GTTCAATCAT ACTTTGGAAA ATGCCCATT CTGTTGGACG CGCTAAATCA 6960
 TACTTCAAAT CTGCAATATG ATTTCTGTGA CGTCTATGTA CTAATTTTTT AAAATCAATG 7020
 TCATATTCAG CACATTCTTT TAAAAATAAA GAACTAAAG TATCAAGCGG TGCATTGCCG 7080
 30 AAATGATGTT TTTAATGTC ATTTAATTTG TCTTTAGTTA AGTACTTGAA TGTCACGTCT 7140
 ATCATTGTAC CTCTTACACT TGGTAAATGA GCAGAACGAC TCGTCATAGT AATTGGTAAT 7200
 TTTGGATGAT GAGCAGCAAC ATAACGGACA ACATCTAAAC TGGCAAGGCC TGTACCAATA 7260
 35 ATCGCAATAT CGTCCAGTTC ATTTACTTCG TCTAACGTAT TATATGTTGG ATAAGGCGTA 7320
 gcGATATATC CTTTTTACC CTTTAAGTTA TATGGATCAT GGTAGGCAAA TGTACCACAT 7380
 GTTAAAAATA CATAATCGTA CGCTTGCCAT GATTGTCCTG AATTGTAGT ACATATGTAA 7440
 40 TAAGTTAAAT TCGTTTCATC GATATTAGAA TTTGTATAAA TCTCTGAAC TTTATTATAA 7500
 TTAGTTGATA TATTTGGATA TTTTTCGTG AACATAGATA AATAAGATTT CATATAATGT 7560
 45 CCGAATACAA ATCTCGGTAA ATATGCAG 7588

(2) INFORMATION FOR SEQ ID NO: 143:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 10320 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 143:

	nCTAGGTATT TTAAACCTAA TCTAGATAAA CTAGCTTCGT AAGCAGCTGC TACATTTTCA	60
5	CGACCGAAAT CCTCAAATA TAATTTTGAA GTAATAAATA AGTCTTCTCT AGCAATACCA	120
	GTTGACTCCA ATCCGGCAGG AATGCCAGCA CCTACTTGTG CTTCAATCCC ATAAACTTTT	180
	GCGGTATCAA TACTACGATA TCCTTGTTCA ATGGCATACT TAACACTTTC CATGCAATTT	240
10	TCATCATTTT CCACACGAAA TGTCCCTAAA CCAATTTGTG GCATCGTGT TCCATTATAA	300
	AATGTTTTAA CCTCCATAAA TATCGCCTCA CCTTTTTGAT GTATTATACC CTGTTATCAT	360
15	AACAAATCTG AGTTGAATAC ATGAGAAAAA ACACTTAGAG CAATCAACCA CTAAAATTCT	420
	AGTAATATCT CTCAAATATT AATCAAATTG TAAAAGTAAT TCTGTTTAAT TTATGACAAA	480
	CTAAAAAAGC CGAAGTAACA ACATATAGTC ATCACTTCAG CCTAACATTT AATTGAATGA	540
20	TTCAATTTTA TCCATCATTT GTTGTAAGTC TTCCACGTTG TATTGAATAC GACCATGGAA	600
	TACAAATTTG TTAAAGAACT CGTCTAATTG TTCAGCACCG ACAAGCACTT TGACAGCACT	660
	ATTTTGATTA TAATTTGAAA TCGTTACATC GCCTTCATTT TTAAGATTAA AGTATAAAAT	720
25	TGAAGTTGGT GTATATTTGG CACCTAATTC TTTTGTAG TCTTCAGCCA ATTGTTTAAT	780
	CGCCTCAATT TGATCTGAAT AATTTACAAA TGATAATGAA CGTTTGTCTAT CATTTTGATC	840
	CATCACAATA GTTTGCGGTC TAGATTTATC TAAATCCAAT GTATCAAATA CTTGTTCCAT	900
30	TGGTGGTAAA TCTTTAAATT GACCGCCACT AATACCATTA TAAACATGAC CTTTTAACAA	960
	TTGAGAATCA ATAATATAAA GACCAGTTCT TGTTAATACT AAATGACTAA TTCGTTCAAT	1020
35	ATTATTAAAG CCATCCTTTG GTAAAAAGAT ATTTGCCATA ATGTGCATAT CTTCTGGTCG	1080
	AATTCGTTTT TCTTTAACTA ATCTTTCACG AATACCAATT AATCTCATGT CCGTTACATA	1140
	TTCACTATGA TTTTTCGAGA ACAATTTTAA TCGGTCAATC TCACGATCTT TTGTACTAAC	1200
40	CATGTGATTA TAATCTTCTT GTTGTTTTGT AATTGTCTTT TTATTTTGAA TACGCTCTTT	1260
	CTCTAAAGCT TCTTCATGAG ACTTTTTAAT GTTTTGTCTT TGTGTTTCAT ACTTTTCTTC	1320
	TGTTTGTCGC TTAACTTTTT TCTTACTACC TAAGGCAACT AAAAAAAGGA CAAAAAAGAT	1380
45	TAATGCAATG AgCTACTGCA ATAATGAGTC CAATGACTAT CGGTGAAGAT AAATCCATCA	1440
	CAACAACGCT CCTTTTTAAT ATATGAATAA CTTTAATTAT AATAGAAaAG CTAAAGATTT	1500
	TCGATACATA TTATCATTTA TATACCGAAA ATCTTTTATT TAGCTATATT CAATTCATCT	1560
50	TATTATTTTA CTGCGTCTTT TAATCTTCC ACTTTGTCTA ATTTTCCCA TGGGAATAAG	1620
	ACATCTGTAC GTCCAAAATG ACCATAAGCA GCAGTTTGTT TGTAATCGG TTGTTTCAAA	1680

55

EP 0 786 519 A2

	AGTTGCCCTT CAGAACTTT ACCTGTTCCA AATGTATCAA TTGCAATTGA CACTGGTTCT	1800
	GCAACACCAA TCGCATATGC CAATTGTACT TCACATTGAT CTGCTAAACC TGCTGCAACA	1860
5	ATATTTTATAG CCACATAACG TGCAGCGTAT GCAGCTGAAC GGTCTACTTT TGTAGGATCC	1920
	TTACCACTGA AGCATCCGCC ACCATGACGT GCATAGCCAC CGTACGTATC AACAAATGATT	1980
	TTACGTCCGT TTAATCCTGC ATCACCTTGA GGTCCACCGA TTACAAAGCG TCCTGTAGGA	2040
10	TTGATGTAGA ATTTAGTTTG TTCATTAATC AAGTTTTCTG GAACAGTTGG ATAAATGACA	2100
	TGTGCTTAA TGTCTTCTG AATTTGTTCA AGTGTACAT CCTCAGCATG TTGTGTTGAT	2160
	ACGACAATCG TATCAATACG TACTGGGTTA TCATTTTCAT CATATTCAAC AGTGACCTGA	2220
15	ACTTTACCGT CTGGTCGTAA ATAATTTAAC GTACCATCTT TACGCACATC TGATAAACGT	2280
	TTTGCCAATT GATGTGATAA ATAAATTGCT AGAGGCATAT ACGTCTCTGT TTCATTCTGT	2340
20	GCGTAACCAA ACATTAAACC TTGGTCACCT GCACCTGTTG CTTCAATTTC TTCTTCGCTA	2400
	TCTTTATCAC GATACTCTAA TGCTTTATCC ACGCCTTGTC CAATGTCAGG TGATTGTTCA	2460
	TCAATCGCAG TTAATAATTGC CATTGTTTCA TAATCATAAC CATATTTTGC TCTTGTGTAT	2520
25	CCAATTTCTT TAATTGTTTC TCTAACAAC TTCGGAATAT CAACATATGT TGTGTAGAA	2580
	ATTTGCCCGG CGATCAATGC CATACCTGTT GTAACAGTTG TTtCACAAAGC TACACGTGCA	2640
	TTTGATCGT CTTTTAAAT AGCATCTAAT ATTGCATCTG ACACTTGGTC AGCGATTTTA	2700
30	TCTGGGTGTC CTCTGTAAAC AGACTCTGAA GTAAATAATC GTTTGTTATT TAACATAGTT	2760
	TGCTCCTTTA AATTTATATT ACGAAAATTC TCTCTCTGTG AGCTAAATAA AAAAGACCTT	2820
	CTAACTATTA ATATAGAGAG AAGGCCTAAT ACGTCCATTC GCTCTTATCG TTCAGACCTA	2880
35	TTTGTCTGCA AAcGGTTTGG CACCTTTCTT TTATAAAAAA GAGGTTGCTG GGTTTCATTG	2940
	GGTCCATGTC CCTCCACCAC TCAGGATAAG AGAATCCGTT AAAAATAATA GTACCTAATT	3000
40	AATGAATTAA TGTCAATTTT TCACAAATAA ATTTACAGTA AAATATTGTA GATTAATTAT	3060
	GTTAATGTGT TATACTAATT AAATGTAAAG GCTTACATTT AAATTATCGC TTTGGAGGGA	3120
	TTTAGGATGT CAGTAGACAC ATACACTGAA ACAACTAAAA TTGACAAATT ACTGAAAAAA	3180
45	CCAACGTCAC ATTTTCAACT TTCGACGACA CAACTTTATA ATAAATCTT AGACAATAAC	3240
	GAAGGGGTAT TAACAGAACT TGGTGCTGTT AATGCAAGTA CTGGAAAATA TACTGGTCGT	3300
	TCGCCTAAAG ACAAATTTTT TGTCTCTGAA CCTTCATATA GAGATAACAT TGATTGGGGA	3360
50	GAAATTAATC AACCTATCGA TGAAGAACT TTCTTGAAGT TATACCATAA AGTACTAGAC	3420
	TATTTAGATA AAAAAGATGA ACTATACGTA TTTAAAgGcT ACGCTGGTAG CGATAAAGAT	3480
55		

EP 0 786 519 A2

	ATGTTTATTA GACCTGAATC AAAAGAAGAA GCTACAAAGA TTAAACCTAA CTTCACTATC	3600
	GTTTCTGCAC CACATTTTAA AGCAGATCCA GAAGTTGATG GTACTAAATC TGAAACCCTT	3660
5	GTCATTATTT CATTTAAACA CAAAGTCATT TTAATCGGCG GTACTGAATA CGCTGGTGAA	3720
	ATGAAAAAAG GTATCTTCTC TGTAATGAAT TATCTCTTAC CGATGCAAGA TATTATGAGC	3780
	ATGCATTGCT CAGCAAACGT TGGTGAAAAA GGCGATGTTG CATTATTCTT TGGTCTATCT	3840
10	GGCACTGGTA AAACAACCTT ATCGGCTGAC CCACACCGTA AACTAATCGG TGATGATGAA	3900
	CACGGCTGGA ATAAAAACGG GGTCTTTAAT ATCGAAGGTG GCTGCTATGC AAAAGCAATT	3960
	AATCTTTCCA AAGAAAAAGA ACCACAGATT TTTGACGCAA TCAAATATGG TGCAATTTTA	4020
15	GAGAACTG TAGTTCAGA AGATGGTTCA GTGGACTTTG AAGACAATCG TTATACAGAA	4080
	AACACGCGTG CCGCTTATCC AATTAATCAC ATTGACAATA TTGTAGTACC ATCTAAAGCA	4140
20	GCACATCCAA ATACAATTAT TTTCTTAAC TCGGATGCAT TTGGTGTAT TCCACCGATT	4200
	TCAAAGTTAA ATAAAGACCA AGCAATGTAT CATTTCTTGA GTGGTTTCAC TTCTAAATTA	4260
	GCTGGTACAA GCGTGGTGTG ACAGAACCTG AACCATCATT CTCAACATGT TTCGGAGCAC	4320
25	CGTCTTCCC GTTACACCTT ACTGTTTACG CTGATCTATT AGGTGAACCT ATCGATTAC	4380
	ATGATGTTGA TGTTTATCTT GTTAATACTG GATGGACTGG CGGAAAATAT GGTGTAGGAC	4440
	GTAGAATCAG CTTACATTAC ACACGTCAA TGGTAAACCA AGCGATTCTT GGCAAATTGA	4500
30	AAAATGCAGA ATATACAAA GATAGTACGT TTGGTTTAA GATTCTCTGA GAAATTGAAG	4560
	ATGTACCGAA AACAATTTTA AATCCAATTA ATGCTTGGAG CGACAAAGAG AAATATAAAG	4620
	CACAAGCAGA AGATTTAATT CAACGTTTTG AAAAGAACTT CGAAAAATTT GGTGAAAAAG	4680
35	TTGAACATAT TGCTGAAAAA GGTAGCTTCA ACAAATAAAT TTGAATACTA AATCAAAAACC	4740
	ACCGGTGTGA ACGGGTGGTT TGTCTGCGG CTATAAGCCT TCCTTACTGG CCAGCCCTAA	4800
40	AAGGGCACTG ACAAGTCAGC CAACTGCACT ACTATTCCAG CAACCCTAAA GGGTACTCT	4860
	TTTTCTTTC TTTTTTTATT TTTCTCTCCA GTGAAAGGAT CTAAATATTC TTCCATTGAG	4920
	ATTTGGTCTG CAACGATATC CTCTGTAAT TGATTACGAA TATAATTTTC AATCACTTTT	4980
45	TTATTCTAC CTA CTGTATC CACATAAAAT CCTTTACACC AAACTTTCT ATTTCCATAT	5040
	CTATACTTTA AGTTAGCATG TCTATCAAAT ATCATTAAAC TACTTTTCC TTTTAAATAG	5100
	CCAACAAATG ATGATACCCC AAGTTTGGGT GGTATACTAA CTAACATATG GATATGATCT	5160
50	TTACATGCCT CTGCTTCAAT TATCTCTACA CCTTTTCTT CACATAATTG ACGCAATATA	5220
	ATCCCTATAT CTTTTTTTAT TTTTCCATAT ATCACTTGTC TTCTGTATTT AGGTGCAAAG	5280

55

EP 0 786 519 A2

AAATAGCATC TCCTCGTGTT GATTATTTTG GTTGGCTGAC CAATATTTAT TCTAGCACGT 5400
 AGAGATGCAT TTTTGTGAC AATGGTAGAA CCTTTTctGa ACCATACGCA TAGCGTATGG 5460
 5 TTTTCTTTTT ACAATTAAAG AGCCAACCGT TGTIATAGTC TAACAATGGT TGGCTCCTCT 5520
 TATTTTATGT GCTAAAAATT TATAGGCAAT TTTATTACAA CAATGTACAT TTAAGGTGAC 5580
 CTTCATGCCA AAATCGCATC ACTCATTTAA TGGAAGCAGC ACGTCTTCAT ATAAAGTACC 5640
 10 GATCCCTAAT TCAACGCATG TAGTACCACA TCTTCAAAGC TTGATAGTTC CCATGCGCAC 5700
 ACCACGTTTC ATACTAGCTA TGCGACTCAA CTTGGTTCAT AAACCTCTTA ATATAAGTCA 5760
 ATGTTTCAAC CATCGCTGGT GGTCTTGCCA CATGTCTTC TGCCATTGA TAAAATGTTT 5820
 15 CATGCGTGGC ACCTTTTAAC TCTAGTTGGT CCGCTAAATA ATACGCATGA TGAATACCAA 5880
 CTTGCTGGTC TTTCCCTCCA TGTACAATTA ATATTGGCGG ACTGTTTTCA TTAATGTTTG 5940
 20 GAATCGCTTG GCGTGCCTCA TATGCCGCTC GATCTTTTTT CGGATGACCA ATCATTCTTC 6000
 GTAGCATGCC TCTTAAATCG ACACGTTCTT CATACTTAA ATCAATATCT GAGACACCAC 6060
 CCCAGATTGT ATAACCTGTT ACTGGTAAGT CTTGAAATGT CAACAATCCT TGTAAACCAC 6120
 25 CTCGCGAAAA ACCAACCATG TGGATAAATG CATGTGGATA TTTATCATGT AGCAACCTTA 6180
 ATAATTGCGT CACATCATTT AAATCGCCAC GGTAAATTC GTCTTTGCCT TCACTCCCAT 6240
 TGTACCTCG GTAGTATGGC CCAATCACTA AAGTTTGA CTCTGAAAAT TGCATTAATC 6300
 30 TACCTGCGCG CACACGTCTT ACTTGACCTT TGCCACCTCG CAAATAAACT ACAATGCGAT 6360
 TTACTTCATG ATGTGGTGTC ATCATTAAAG CTTTTACTTG TAAGTCATCT GACAAATATG 6420
 TAATTCTTC GAATTGATGC GTAAAATATT CAATTGGCAT TCGTTTACGT TTGATAAAAC 6480
 35 CCAAGTGATT GCACCCTCTC TACGCATTTT AAAATGGTAC TATCTTGACG TAAGAACTC 6540
 CGTTGTGCGA GTTCAATATC ATTGATACAG TTAAACAACA CTGGCCCTGC TGTTCCTAAA 6600
 40 TAATCGTTCT TGCTTACCAA TGATTCAACT TCGATAAAAT ATACATCTTT TACAAAATCA 6660
 GTTTGATCAT GTGTTTCAAT GGTATATTGT GCTATGTAAT AAATATTTT AACTTTGGCG 6720
 CCTGTTCTT CATATAATTC aCGTGTA ACTTCAGCAC TACTTCCCC GCGTCCCTT 6780
 45 TTACCACCAG GAAATTCAAT CCCCCGTAAA TTATGTTTGG TAAAAAGCAA TTGATTTTAA 6840
 AACGTTGGAA TAGCTAGCAC ATGATTGCCA TCTGCTATCT CATTATCCTT TTTAAATGTC 6900
 AAATTAACCT GACGATTATC TTTATCCCTA AACTTCACGC GCATCACATC CCTACATTGT 6960
 50 ATGTTAATAT AATAGTTAAT TACTATCGTT GGAGGCATTA ATTATGAAAA AGATATTCTT 7020
 GGCGATGATT CATTTTTATC AACGTTTCAT TTCGCCACTC ACTCCACCAA CTTGTCGTTT 7080

55

EP 0 786 519 A2

	CCTTTATTTA	GGTATCCGTC	GTATTTTAAA	ATGTCATCCG	CTTCATAAAG	GCGGCTTTGA	7200
	CCCTGTTCCG	TTAAAAAAG	ACAAGTCAGC	AAGCAAGCAT	TCACATAAAC	ATAACCATTA	7260
5	ATATGTTTGT	AATTGAGTTA	TATCCACTAA	AGGGGGGCGA	AATTCGAGTC	GCCCCCTCTT	7320
	TAATATGCCT	GAATGCGCCA	CCACATCTTG	TTCAAAATAA	TAACCTGCTG	GTGTAACATC	7380
	TCCTGGATAA	TCACCTTTAC	GAGCAAGCAT	CGCTGTAAAA	TAGCGGCTTA	AACCATATTC	7440
10	GTACATGCCG	CCAATAACCA	CTTTTGCACC	ATGACTTTTC	AAAGTATCAA	TTGCCGTTTG	7500
	CACTTTATCA	ATGCCACCTA	GACGAAATGG	TTTTAATACA	ACAACTTTCA	CATTGTATAA	7560
	TTCTATCAAA	TTAATTATGT	CCaACAACGA	TGTTGCCTTT	TCATCAAGGG	CTATTGGAGG	7620
15	TATTGTTCCA	TCCGCTACTT	CATCAAGCAT	GGAGATATCT	TTAAATGGCT	CTTCGATATA	7680
	AAGAACCTGT	TCACGCGCTA	ATAACTGTAA	CTGTGTGAAA	TCTTGACGAT	CCAAGGACTC	7740
20	ATTTGCATCT	ATAACCAATT	GAAAGTGAAA	GTCTAATTCC	CGTAACACTC	TAATTTGATG	7800
	CATGATTTGA	GGCGTCCATT	TTAATTTAAT	TCTGGTCGGC	TTTGTTGCTT	TTAATGACTC	7860
	TAGTTGTTTA	TTTGATAAGC	CGCTCGcTGT	CGCTCCATAT	GCTACTGAAA	ATGAAGGCAG	7920
25	TACATGAAAC	ATTTGATACA	ATGCCATGAC	AATAGTTGCC	CTTGACGAG	GCGTATTTTC	7980
	CAATGAATCT	ACTAATTTTA	GTGCTGCTTC	ATACGTTTCA	AATGATTTAT	TTCTATTATC	8040
	TTCGAACCAT	TGCTCAATTA	CATGTTTCAC	TGAGGCAATT	GTTTCATGAT	CATACCAATC	8100
30	TGTTTGAAAA	GCGTTACATT	CCCCGAAATA	TGCATTTCTT	TTGTCATCAA	TCAATTCGAT	8160
	AAACAAACAA	TCACGATGCG	TTAAAGTGAC	TTTCGGTGTT	ACAATTTGTG	ACTTAAATGG	8220
	CTCACTATAT	TTATAAAAAT	GCAAAGCTGT	CAACTTCATC	AAATCATCCT	CTATACAAC	8280
35	TATTTCTTTG	TAATTTACCT	GTTGATGTAT	AAGGTAAAGT	ATCAACCTTT	TCAAAGTGTT	8340
	TCGGTACTTT	ATATTTTCGCT	AAATGTTGTG	ATAAATATGC	AATCAATTGT	GCCTTTGAAA	8400
40	TGTCACCTTC	ACTGACAAAA	TATAATTTAG	GCACTTGGCC	CCAAGTATCA	TCAGGATGCC	8460
	CTACACATAC	TGCGTCACTG	ATACCTGGAA	ATTGctTCGC	TACCGTTTCA	ATTTGATATG	8520
	GATAAATATT	TTCACCGCCA	CTAATAATTA	AATCTTTACG	TCGGTCATAA	ATCATGACAT	8580
45	AACCTTCATG	ATCTATTTC	GCAATGTCAC	CCGTATTAAA	ATAACCATT	TCAAACGTAC	8640
	CCGTTAAATC	TGTTGGATAC	AAATATACAT	TCATCACATT	GGCGCCTTTA	ATCATTAAAT	8700
	CTCCATGACC	TTCTTTTATTA	GGATTTTTAA	TTTTTACGTC	AACATTGGCA	CTTGGCATCC	8760
50	CTACAGTGTC	AGGACGTGCA	TGCAACATTT	CCGGTGTTGC	TGTTAAAAAT	TGCGAACATG	8820
	TCTCAGTCAT	ACCAAATGAA	TTATAAATTG	GCAGGTTATA	TTGTAATGCC	GTCTCTATCA	8880

55

AACCTTGTTG CATAAGCCAA TTAAAGTTT GTGGCACAAG CGAAATGTGC GTGATTCGTT 9000
 CATTTTTAAT CATCGTTAAA ATTTGTTCCG CATTGAATTT ATCAACAATG CGCACAGTAA 9060
 5 AACCTTCAAT AACAGCTCTT AAAAGTACAC TGAGACCCGA AATATGATAA ATCGGCAAGA 9120
 CAGATAGCCA ATTAGTGTCA CGATCAAATC CCAAGCTCTC TTTACATCCG ATTGCACTGG 9180
 CATAATGATT ACGAAACGTT TGTGGCACCG CTTTTTGAGG GCCCCTTGTC CCTGATGTAA 9240
 10 ACATAATCGA TGCAATGTCA TCTAAATTAA ATGATGTATT TAATATGTTG GACGGCGACT 9300
 CTTTCGGCAC CACAGTTTCA TTCGATGTTT CATATTGGAT ACCCATTGTG TTGTCCAACA 9360
 AACTGTTTCGT TGTAATATCC CTTCCAGCGA ATTCAATATC ATCCAGCGAT ACAATTTGAA 9420
 ACCCTCGTAA TTCCAGTGGC AAGGTACAAA AAATCAATTG TACATCGATT GACTTCATCT 9480
 GATTCGTCAT CTCATTAGGT GTCAACCTTG TATTAATCAT CGCAATTTCA ATATTTGCCA 9540
 20 ACCAACATGC ATGTATTAAA ATGATCGATT GAATCGAATT ATCTATGTAT AGCCCAACAC 9600
 GAGATTGTTG ATAAGCCTTG AGTCTTTTAG CCAATAGACT CGCTTCACAG TATAAATTTT 9660
 GATAAGTATA AGATTCTTGA CCGTCTGTTA TCGCAATATG ATGTCCATTT TGTGTGCTT 9720
 25 GTTTATATAA CCAAAAGTCC ATGCGTTATT CCTCCAAAAT CATTACATT ATAATTATAA 9780
 CGATTTTATG ACATTCTAGC AGTGGTTATG TTTAAAAATA TAAAAAAGTA GACGAATTGA 9840
 TGCATTGATA TGATTGTTAT AATGCTCAAT ACATATCGTT ATATCATTCG TCTACTATTA 9900
 30 TCAGTTATTT TTAATTAATT TTAGTGTCTAT TCTGTCAATTT TGATGTGGTG ATTTACCCAT 9960
 TGTGCCCACA TCATCTGCAA TGTCAATTGG TATACGGTTC ATGTCTTGTA ATGCACTTAA 10020
 ATGGAATACT TCATCATCTA AATTTTCAAT GAGATATACA TAATATGTTA CCTTGTCTT 10080
 35 TTTATATTTT AACGTTTTCC AAAAGTCCGG CTTGCAATTC AATACATTAT CCGGAATATA 10140
 TTCAATAAAT AAGTAACGTT TGCTGCCTAC TTTGTCTATG AAATATTTTG CAGTGCCTTT 10200
 40 TTCTATACCT CTTATATGTG CATAGTCTGC TGAAAAGTAA ATACTACCTA TTGTTTCATT 10260
 ATGTTGTTGT ATTTCAAATC GTTGGCCTAC TATTTTATTA TTTGTGCTAC nGGGGACTTA 10320

(2) INFORMATION FOR SEQ ID NO: 144:

45 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 1477 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear
 50

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 144:

55

GTGTGGATTG GATTTTAAAA TCACCCTCAT AAATACTGTC ATCAATATGA TAAGTTACAA 120
 TTTCACCTAT TATTAAATCA GCCCCATCTA ATACATCTCC AAGCAATATC ATTTGCGmTA 180
 5 GTTTACATTG GAATCTCATT TTCGCATCTT TAATTCCTGG CGTCTTAATC GTTGTAGATG 240
 TTAAGAGTGA TAATTCTGTA CGACTCAACT CACTGTCACC ATATGCTAAC GGCGCTGCAG 300
 TCTCATTAAAT ATCTTGAACA TTATCTTCGT CTGTAATATG CACAACAAAG TCTCCAGTCC 360
 10 GTTCTATATT TAATGCAGTA TCTTTTCTCT TACCTCCTGC ACGTTGAACT GCAATAGCAA 420
 TCATTGGCGG ATGATTATTA ACAATATTAA AAAAGCTAAA TGGTGCTGCA TTTACTGATG 480
 CATCTTGATT TAATGTTGTA ACAAAGCTA TAGGTCGTGG AATAATTGAA CCAATTAATA 540
 ATTTATAGTT TTCTCTAGCA GTTAATGATT GTGCATCAAA CGTATACATA ATACCTACCT 600
 CTTTTCTAAG TATATCTAGG TATTTCTCCG ATTTTGGTTA ATTTAAACAT CTATTCTCCT 660
 20 CTGAAATCA CTTGTATTTA TTTAGCAAAT CTTTGAAT ATGACACATA TGCATATCTT 720
 CTGGATATTT TTCTAAATGT TGCTGATGTT CTTCAGCACT TTTAATGTAG TTAGACAGCG 780
 GTAAGACTTC CACTGCAATT TGATCTCTGT CTTTACGTCG TTCAATGAAC TGACGCGCTT 840
 25 CAATTAAGTG GTCATCTACA CAACTATATA AACCCTTCG ATACTTTTGT CCAATATCAT 900
 TTCCTTGTTG ATTCACACTG TAAGGATCAA TGATTTCAAA TAAATAATTC ATAATGTCTG 960
 TAATTGTTAA CATACGATCA TCGAAATGAA GTTGACACA TTCAGCATAA CCATCATACG 1020
 30 GACCGTCTAA TTTAGAGCTT CTTCCATTG CTCTTCCTGC TTCTGTATGT ATAATTCAG 1080
 GTATTGTTGC AAAAAATGCT TCAACACCCC ATAAACATCC TCCTGCTACA TAAACAACCTG 1140
 CCATATTTAC ACCTCATCAT CCTTTTTTAT ATTTTAAACA AGGTTATACC ATTTAATACC 1200
 35 GCCATGACAT GATTCTGATA CACCTTCATT ACGATACCCA TATTTTTCAT AAAATGAAAT 1260
 TAATGATTCT CGACATGTTA ACGTTACACC ATGTCGATGA TGATTCTTAG CAAGAGTTTC 1320
 40 AAAATAGTTT AGTAAGCGAC CTGCAATACC CTGACCTTGA TAATTGGTG CTACAACAAG 1380
 ACCTAACACA CTAATATAGC CACCTTCACT ATTATTTGTG GAGACATTTT TAAATAAATC 1440
 ATCGCTAATG TAACGCTCTT TTATGACTGG ACCGTTG 1477

45 (2) INFORMATION FOR SEQ ID NO: 145:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 3976 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

55

	AGGTGATTAT CCTAAAAATG CTCATGAGGT CGCTATTAAT GATAAGTTAG CTGCAGACAA	60
	CATTAGAGTC GGGGATAGAT TACATTTTAA AAATAATTCA ACTAGTTATA GAGTTTCTGG	120
5	TATTTTAAAC GACACAATGT ATGCGCATAG TTCCATTGTG CTATTGAACG ATAACGGATT	180
	TAATGCATTG AATAAGGTTA ATACGGCATT TTATCCAGTG AAAAATTTAA CACAACAACA	240
	ACGTGATGAG CTTAATAAAA TAAATGACGT TCAAGTTGTG AGTGAAAAAG ATTTAACAGG	300
10	TAATATTGCG AGTTATCAAG CAGAGCAAGC ACCGTTAAAT ATGATGATTG TTAGTTTGTT	360
	TGCTATTACA GCAATCGTTC TAAGTGCATT TTTCTATGTT ATGACGATTC AAAAAATATC	420
15	ACAAATTGGC ATTTTGAAAG CAATTGGTAT TAAGACAAGA CATTTATTGA GTGCGTTAGT	480
	TTTACAAATT TTAACACTAA CAATAATTGG GGTAGGTATT GCTGTGATCA TCATAGTAGG	540
	ACTATCATT ATGATGCCGG TAACGATGCC TTTTACTTAA ACAACGCAAA ATATTTTATT	600
20	AATGGTGGGG ATATTTATAT TAGTAGCGAT TTTAGGTGCC TCACTATCAT TTATCAAATT	660
	ATTTAAAGTG GATCCTATCG AAGCAATTGG AGGTGCAGAA TAATGGCATT AGTCGTTGAA	720
	GATATCGTCA AAAATTTTCGG AGAAGGTTG TCTGAAACAA AAGTTTAAA AGGTATTAAT	780
25	TTTGAAGTGG AACAAGGGGA ATTTGTCAAT TTAAATGGTG CCTCTGGTTC TGGGAAAACA	840
	ACATTGCTAA CGATATTAGG CGGATTGTTA AGTCAAACGA GTGGTACAGT GCTTTACAAT	900
	GATGCGCCAT TGTTTGATAA ACAGCATCGT CCTAGTGATT TACGATTGGA AGATATTGGT	960
30	TTTATTTTTC AATCTTCACA TTTAGTTCCT TATTTAAAAG TGATAGAGCA ATTGACACTC	1020
	GTAGGTCAAG AAGCGGGAAT GACCAAACAA CAAAGTTCAA CAAGAGCAAT ACAACTTTTG	1080
35	AAAAATATTG GTTTAGAAGA TCGCTTGAAT GTATATCCGC ATCAGTTATC TGGCGGTGAA	1140
	AAGCAACGTG TTGCGATTAT GAGAGCATTT ATGAATAATC CGAAAATCAT TTTAGCAGAT	1200
	GAGGCCACAG CAAGTTTAGA TGCCGATAGA GCAACAAAAG TTGTTGAGAT GATACGTCAA	1260
40	CAAATTAAAG AACAACAAAT GATTGGTATT ATGATTACAC ACGATCGAAG ATTATTTGAA	1320
	TATGCAGATC GAGTGATTGA ATTAGAAGAT GGCAAAATAA CTGATTAGTG GCTTGTAAG	1380
	ACGCTAAATG TTAATGATTT AAGACATAGT AGTATAAAAG TTAGATAACA GAATACGATT	1440
45	TGGGTTTACA AAAACAGGC TGGGACATTA AGTCTTAGG CAATGTAAAA AAGCTGATTT	1500
	CTATTAATTA TTTGATAGAA ATCAGCTTTT TTGATATGTA TTTTATAATG TACAGCTCGT	1560
	TGCATTATA TAGCTTGAAG TCACGTTTAA AACCATATCT ATCATTATGG TATGCATATC	1620
50	TTTTAAACC TATTCTTTTG TTATTAGGAC ATATAAATTC ATCATTAGT TCGTCATATT	1680
	TCCAATTTTG AGTGTTAAAA ATGTCACTTT TAACTTTCT AGTTTTATCT TTAATAAACA	1740

55

	CACTATCATA ACATGCATCA GCTACAATAT ACTCCGGTAA ATAACCGAAG nTATTTTgAA	1860
	TCATTGTTAA AAATGGAATT AAAGTTCTAG TATCTGTTGG GTTTTGAAAT AGGTCATAGG	1920
5	ATAAAACAAA TTGAGAATTT GTCGCTATTT GTAAATTGTA TCCTGGCTTA AGTTGGCCAA	1980
	AGTGTCTTAT TTTTTTAAAG TATTTAAAAG TAAAATTACA TGTTAATACG TAGTATTAAT	2040
	GGCGAGACTC CTGAGGGAGC AGTGCCAGTC GAAGaCAGGG GCCCCAACAC AGAArcTGAC	2100
10	ATATAGTCAG CTTACAACAA TGTGCCGTT GGGGTGGCTG AGACGGCACC CTAGGAAGGG	2160
	ACCCGTCATC AAAAATTCTA TTTATAGAAT TTTACAGTAA TGTGCCAGAT GGGCATAGCG	2220
	AagcATTCA ATACGAAGTA TTGTATAAAT AGAGAACAGC AGTAAGATAT TTTCTAATTG	2280
15	AAAATTATTT TACTGCTGTT TTTTTTAGGG ATTAATGTCC CAGACTCTTT AGTTTATTTA	2340
	TTTTCAATAT AACAAATGTC TAATCAAGGA TTAACGAATA TTAAAGATA GTTTGACGCA	2400
20	ATATTAGAAA CAACCTATAA TAATAGTTTG TTTGTGGATT AACTATTATA AATAAAAGCG	2460
	GCGTAAAGAC ATATAAACCA ACTACTTGAA CAATATAACG TTAATAACAA TCTATACTGA	2520
	TACATTACGC CTAGATAATC TTTGATGAGC ACATGTAAGA AAAAGTGATA TGGTGTATGA	2580
25	CTTCCGACAC CATCGATAGA TAAACCTAAT TTTTGGGCTA GTCGTAAGGC GCGCAATACA	2640
	TGAAACTGAC TTGTtACACA AACAAITTTA ACTGCTTCAT GATACAAATT GTTGATGATT	2700
	TGTTTAGAAT ATAAAAAGTT TGTGTATGTA TTTATAGAGT GAGATTCCAT TAGTATATCT	2760
30	GTTTTATCAA CACCATGTGC AATCAAATAA CGTTGCATAG CTAAAGCTTC AGAAATTGGT	2820
	TCGTCTGGTC CTTGTCCGCC AGATACAATG ATCTTTGTTG CTGATGCTTG TTGTTGATAG	2880
	ATATCAAGTG CACGATCTAA ACGCGCTGCA AGCATTGGTG TGACAAATTC GGTAAAAATA	2940
35	CCAGCACCTA ACACAATTAT GATATCAACT TCTTTGTTGT ATGATCTATG TCTATATGAT	3000
	ACTGfCCAAA CGAGATAACA AATAAAGGTT AGTAACAGGG AAAGACATAA TATAGCTAAC	3060
	CACATAGACA AACCTTTCAC AATAGGTGAC TGAATCGTAC TTATAAATAG AAGTGCTGAT	3120
40	GTGTAGAGTA CAAATTTATA TGAAAAAGAT AATAATTTTT TAATAAATAA GCGACTAGAA	3180
	GTATGAGAAA ATAAATATCT ATGTTTGAAT AGCATGATAA TACTGATTAT TATAAATGTT	3240
45	ACAAACATAG ACCAAGGGAA AGTATAGGTC ATGATGCTAT AGATGAGTGA CAAAAATATC	3300
	GATATGACAA CTAAGATGTA GCATGTTAAA TTTAACGTCA GAGTATAGTT GAAAATTAAC	3360
	GGACAAATAA CGATAAGTAT AAATATTAAT AATAAATTCA ATAACATACT GACACCTCGC	3420
50	TTATAATAAA TATTAAATAT AAATGTAGAT GATTTAATTT ATTAAAGCAA GGAGAAAGCA	3480
	GCAACATGTA AATCTTAATT TGTATATTA TATATGGGTC AATATTTTTG TGTTTTTTAG	3540

55

TATGGTAAAA CATTTACAAG ACCATATTCA ATTTTITAGAG CAGTTTATAA ATAACGTTAA 3660
 CGCATTAAGT GCAAAAATGT TGAAAGATTT ACAAATGAA TATGAAATTT CATTAGAGCA 3720
 5 GTCTAACGTA TTAGGTATGT TAAATAAAGA ACCTTTGACA ATTAGTGAAA TCACGCAAAG 3780
 ACAAGGTGTA AATAAGGCCG CAGTAAGCCG ACGAATTAA AAGTTAATCG ATGCTTAATT 3840
 AGTTAAGTTA GATAAACCAA ATTTAAATAT TGATCAACGT TTGAAATTCA TAACCTTAAC 3900
 10 TGACAAAGGT AgAGCATATT TGAAAGAACG TAATGCGATT ATGACAGATA TTGCGCAAGA 3960
 TATTACTAAT GATTTA 3976

(2) INFORMATION FOR SEQ ID NO: 146:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 3346 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 146:

25 GCTACCTAGG CATTTAAGAG ATCAAAAAAT GTATGAATAT GAACGTTATT TTTATGAGCA 60
 AGAACTTAAT GCGCTTGATG aAGGGGAAAT TTTAAAGAAG TTAAAAGACC CACAAGATGT 120
 TGCAGCTGAA ACAAAGCTA GAAGTGTTAT TGATTATGCT GAATCTAAAC CAACATTTGA 180
 30 AAATATTTCA AGAGCTGTTG CTGCTTCATT AAGTTTAGGC ATTCTATCTA TTTTGTGCAT 240
 CCTTATACCA GTATCTATAG TTGGATTATT TGTATTAGCA TTATTTTAA TATCACTTTT 300
 GCTGCTGTTT TGTCCAATTA TTTTATTAGC ATCAGCAATA TCCAGAGGAA TTGTGGACTC 360
 35 AATTAGTAAT GTATTTTTTG CCATATCATA TTCAGGATTA GGATTAGTAT TTATCATTGT 420
 CATATTTAAG ATTTTAGAAT ACATTTATCG TTTAATCTTA AAATATTTAC TTTGGTATAT 480
 40 TAAAACTGTC AAAGGAAGCG TTAGAAAATG AAGAAATCTT TTTTATTGG GCTTTTAGTG 540
 TTTGTTGTCT TTTTACAGC AGCAACCATT ATTTGGTTCA GCTATGATAA AAACAAATAT 600
 GGTACTAAAC AATATGATAA AACATTCAA gACGATGCTT TTGACAATGT ATCTATAAAT 660
 45 TTGGATAGTA CAGAACTTCG TATAAACCG GGAATCAAT TTAGAGTTAA ATATGATGGT 720
 GACAATGATA TATTAATTAA TATAGTAGAT AAGACGTTGA AGATTAGTGA TAAAAGGTCT 780
 AAGACAAGAG GATATGCAAT TGATATGAAT CCTTTTCATG AGAATAAGAA AACGTTAACG 840
 50 ATTGAAATGC CTGATAAAAT GATTAAACGT TTAATCTAT CATCTGGAGC AGGAAGTGTT 900
 AGAATCAGTG ATGTTGATT AGAGAACACA AGTATTCAA GCATTAACGG TGAAGTAGTT 960

EP 0 786 519 A2

	AGTAAAAGTA ACATTAAAA TAGCAATATT AAAGTTGTTA TTGGTACGCT ACAAATCGAC	1080
	AAGAGTCAAA TTAAACAATC CATATTTTAA AACGATCATG GTGACATTGA ATTTAAAAAC	1140
5	ATGCCATCAA AAGTAGATGC AAAAGCTTCT ACTAAACAAG GAGATATTCG TTTTAAGTAT	1200
	GATAGTAAAC CTGAAGACAC TATACTAAAG CTAAATCCGG GAACGGGTGA TAGCGTAGTT	1260
	AAAAATAAAA CATTACTAA TGGTAAAGTT GGGAAAAGCG ACAATGTTTT AGAATTTTAT	1320
10	ACGATTGATG GTAATATCAA AGTTGAATAA ATAAAGGATG TAAGCACCGA TATTAGGAAG	1380
	CATAATTTCT CTAATATCGG TGTTATTTAT TTGTTGGCAA AAGTTAAGTC GGTATCTATA	1440
	TTGCCAGTAA AGTGAGTGAT ATTAAGGTCT TGACCATCTA ACCATGATTT GAAATCTATT	1500
15	ATTTCTGGTG GCGCATTTTC TCCCAATGTA AAATATGCAG TTAATGTTTC AGGTTGATAC	1560
	ATTGATGTAT GGATGGTGCC AGACCAGCTT TTGAATAGTT TACTGTAAAT TTCATACTGA	1620
20	GGATTATTGA ATAACTTAAA TGCTGTAGTC ATATCTAAAT TATCATTAGT TTGTGAAATG	1680
	GTACGCGCCA GTCTTTCTTT AGATTCTTTT GTATAATTAC GATTTTTCATG TGTTAATATT	1740
	TCAAATGAT TTGTACATAT ATTATCATAA CGAACATCTA TTGATCTCGG TGTCACCTCA	1800
25	ACAATTGCAT GGTTCATGA TTTGTCCATC AGTATGTAGC TAAATGAGCT TCTGTGTGGT	1860
	ATTTCTTTCA ATAATTGGAT TGCTTCTGTT ACATTTCCGC AATTTTCAAG AATTAGACGA	1920
	CCAATCATAT AACATACAAA ACCATTTGCT GGTTCCTTCC GGTGCATAAA GTTATAGCCC	1980
30	ATAGTTAATC CTGACTCATT CATACCATCC ATTCTTCCAG TTACCCTTGA TACAGGACCA	2040
	ATTTGAGCTA AACCGCTATC TGTAGGTTGA TAAAGTAAGT AGCGACCATC ATAAGTTGCA	2100
	GGGTGGTAAT CATAATTTCT AACCATGAAG TCTTTGCCTT GAAAGACCGT GCAaCCACTT	2160
35	TCTTTTAAAT CGGTAAAACG ATAATGTCCA AAGTTTAAAA TAATTTGGCG TGTTGGCATT	2220
	TTGAGTATAC TTTGTAGTCC CATTAATTCT TCCCATATTT GAGGTGCGTA TGTTTGAAT	2280
40	ATTTGATAAG TTTCATTTAC ATCTATATCG AAACGTGGGA CaChTTTTTT CCATTCTTTT	2340
	TCTCGATTTT TTAGAAGAGG TGTTTGTGA AGCCATTTAC CAGTTTTAAC ACCTAACTCG	2400
	AAATGTGAAC CTCTAAAAGT CATGATATCT GATGTCACCT GTTGCAATC ATCGGCCCTT	2460
45	TTCTTTTATG TTGTAATATA TTGTAAATAA ATAGTAATCG TATGTATATT GAATGTCATG	2520
	TTAAATAAAG TTATATTTTA CTAAATGAAA TATAAAATTG TTTGAGGTGA TTTCTCGGTG	2580
	TATAAGACTT ATCAATCAGT TAAAACATAT TTTTATAGAT GGTGGGGATA TTGAGTTAAA	2640
50	AACTTAAAT CATCTTATCA TAAATATCAA TCTTAAGTTA GCATTCACGA TAATAGTCAT	2700
	TGTTAACATT AGCATATAAG GTCATGTCAC GTTGAAACAG AGGTTCTCTG GCATTTTGA	2760

55

	TTATTTAATG ATTATTCTAT ATATGATAGT ATAATGAAAT GTAGATAGGT ATTTAATTTA	2880
	ACAGAGGTGA AATTGAGATG TGGAAATTTA TTAAATGtGT GkTTAAATTC GTATTTAGCT	2940
5	TAGTTGCTAT TACAACATTA GTTGCTGGTG TTGGTGTAGT AGCATTGCT TATATCTTTA	3000
	AAAAAGATTT TGAAGATATT GAAAGAAAAA CTAAAGAAAT TATTTCTGAT ATTGAAAGTA	3060
	AAAATAACTA ATAACATTTA GAGGCTGGGA CATAAATCCC TAAAAAACAG CAGTAAGATA	3120
10	ATTTTCAATT AGAAAATATC TTAGTCTGT TCTCTATTTh ATcAmTACTe CGTATTGAAT	3180
	GGCTTCGCTT TCCTAGGGTG CCGTCTCAGC CTTGGTCTTC GACTGGCACT GCTCCCTCAG	3240
	GAGTCTCGCC ATTAATACTA CGTATTAACA TGTAATTTTA CTTTGGAAT ACTTTTAAAA	3300
15	AATAAGACAC TTTGGCCCAA CTTGGCACAT AAATGTAAAA TTCAAT	3346

(2) INFORMATION FOR SEQ ID NO: 147:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 2375 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 147:

	GTGAAGAAA GAAATATAAC AGTCAATTAT AATTATAACC TTGTTGAAAT CGACGGTGAC	60
30	AAAAAAGTGG CTACATTCGA ACATATCAAA GCATACGATA GAAAAACAAT AAGTTATGAT	120
	ATGTTACATG TAACACCACC TATGGGTCCC TTAGATGTAG TAAAAGAAAG TACACTTTCA	180
	GATAGTGAGG GTTGGGTAGA TGTTAACCCA ACCACATTAC AGCATAAAAG CTACTCTAAT	240
35	GTATTTGCAC TTGGTGATGC TTCAAATGTA CCTACTTCAA AAACAGGCGC ACTATTcGTA	300
	AGCAAGCACC TATCGTCGCT AATAATTTAT TGCAAGTGAT GAATAATCAA ATGTTAACGC	360
40	ATCATTATGA TGGTTATACT TCATGCCCTA TTGTACTGG ATATAATAGG TTAATACTTG	420
	CAGAGTTTGA TTATAATAAA AATACTAAAG AAACAATGCC GTTTAATCAG GCCAAAGAAC	480
	GtGAAGTAT GTATATATTT AAGAAAGATT TATTACCTAA AATGTATTGG TACGGCATGC	540
45	TAAAAGGATT AATATAATAA AGTACAGAAA ACAATAAATT TTTAATGAAA AATCTTTTAC	600
	TATAAAAGAT TAAGTATTTA AATGACGTGT CAGTGTTGTG TTTATATGTC GTGAATTTTT	660
	AGCTCTAAAT AGTATAAGAT TGAAAAAGTT GTTACTGTTT TAAATGATCA CGATGAAGTC	720
50	ATTCAATAAG AATGATTATG AAAATAGAAA CAGCAGTAAG ATATTTTCTA ATTGAAAATC	780
	ATCTCACTGC TGTTTTTTAA AGGTTTATAC CTCATCCTCT AAATTATTTA AAAATAATTA	840

	AGATATTCAA ACCACGTGTA CTCAAAATGA TAGCTTGGTA TGTACCTCCA ATAGTAATTT	960
	CAATAACTTT GTCTGTTGAA CACTAAGAGC AATTTTAATT TCATAATGTG TTGTAAACAT	1020
5	TTTTTTTGAT TGGAGTTTTT TTCTGAGTTA AACGATATCC TGATGTATTT TTAATTTTGC	1080
	ACCATTTCCA AAAGGATAAG TGACATAAGT AAAAAGGCAT CATCGGGAGT TATCCTATCA	1140
	GGAAAACCAA GATAATACCT AAGTAGAAAG TGTTCAATCC GTGTAAATTT GGGAAATATC	1200
10	ATCCATAAAC TTTATTACTC ATACTATAAT TCAATTTTAA CGTCTTCGTC CATTTGGGCT	1260
	TCAAATTCAT CGAGTAGTGC TCGTGCTTCT GCAATTGATT GTGTGTTTCAAT CAATTGATGT	1320
15	CGAAGTTCGC TAGCGCCTCT TATGCCACGC ACATAGATTT TAAAGAATCT ACGCAAACTC	1380
	TTGAATTGTC GTATTTTCATC TTTyTCATAT TTGTTAAACA ATGATArATG CAATCTCAAy	1440
	ArATCTAATA GTTCyTTGCT TGTGTGTTGC CGTGGTTCCT TTTCAAAAGT GAATGGATTG	1500
20	TGGAAAATGC CTCTACCAAT CATGATGCCA TCAATACCAT ATTTTCTGC AAGTTCAAGT	1560
	CCTGTTTTTC TATCGGGAAT ATCATCGTTA ATTGTTAACA ATGTGTTTGG TGCAATTTTCG	1620
	TCACGTAAAT TTTTAATAGC TTCGATTAAT TCCCAATGTG CATCTACTTT ACTCATGCGT	1680
25	TTGATAAAAA CTAAATAAT ATTAATTCGG TCATCAGTGG CGTTAAATCT TTTATCATTT	1740
	TTAGTTATAG TTGATAAATT TATATTTATA AGCATATATG GATATTTTCAT CAAAAATTTT	1800
	TATTTATATA AATCCGAACT GCATACATAT TTGTTTAAAT AAGAGGTATT ATTTTTCGGG	1860
30	AAATTGCTGT CTGAGTTAAA AGGATTAGTT TTATAAAATG AGTTGAACTA TAGCCAAAAA	1920
	CGATTAAAAT ACTGATAATC CATTTTTGLA TTATGTTAGG GACTTTTTTA CTTAATTTTA	1980
35	ACCCTATTGG aGCMaATATA ATACTCCCTA TTATAAGGAA TAAGGCGTCA TATAAaGGGA	2040
	TATAACCTTG AATAAGTTTG ATGACAAAAG CACCAATTGA AGATATAAAA GCAATTACTA	2100
	TACTATTAGC GACTACAGTA TTCATTGGTA ATTTGAATAA AACCAATAAT ATAGGAATAA	2160
40	TAATGAAGGC ACCACCTGCA CCTACTATAC CTGAAATAAT ACCAATGAAA AGGCCAATGA	2220
	TAACATAATA ATATTTATTA AATGAAGACT TTTCGGAAGT AGGTTtCACT TTAATAAACA	2280
	TTAATGTTAA TGCAAGTAAA GCAATAATGA TATATACCGT ATTTACAAAT GTAGCATCAA	2340
45	ATAAATTTGC TAGAAATGCA CCTAACATAC TCCCT	2375

(2) INFORMATION FOR SEQ ID NO: 148:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6115 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

EP 0 786 519 A2

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 148:

	GAGGTTTCTA GACAAGCTTT TAATAACTTA CCAAACATCAT TAAGrTGGTT gTGlTGGACT	60
5	GCCTATTATC mAAGtATTAT GaGTTGTTTA ATATTAGtGC TAARACATAC GAAGAGTGGT	120
	TTAAACAATT TAGTAGTAAG AAAGCACAAAT TCAGTATTAA TCTCACGGAT AAATGGATAA	180
	TTCAATCGC ATATGGTAAA TTAATAATAA TGGCTAAAAA TAATGGCGAT ACATATTTTA	240
10	GAGTTCAAAC AATTAAAAAG CCAGGTAATT ATATTTTTTA CAAATATCGA TTAGAGATAC	300
	ATTCTAATTT ACCAAAATGT TTATTTCCGC TTACAGTGAG AACACGACAA AGTGGCGATA	360
	CATTTAAACT GAATGGGCGC GATGGTTATA AGAAAGTGAA TCGCCTGTTT ATAGATTGTA	420
15	AAGTGCCACA GTGGGTTCGG GATCAAATGC CAATCGTATT GGATAAACAA CAGCGCATT	480
	TTGCGGTAGG AGATTTATAT CAACAACAAA CAATAAAAAA ATGGATTATA ATTAGTAAAA	540
20	ATGGAGATGA ATAGCGTTAT GCATAATGAT TTGAAAGAAG TATTGTTAAC TGAAGAAGAT	600
	ATTCAAATA TCTGTAAGGA ATTGGGAGCA CAATTAACAA AGGATTATCA AGGTAAACCA	660
	TTAGTATGCG TGGGTATCTT AAAAGGCTCA GCAATGTTTA TGTGAGATT AATTAAACGA	720
25	ATTGATACCC ATTTATCAAT TGATTTTCATG GATGTTTCTA GTTATCACGG AGGCACTGAG	780
	TCAACTGGTG AAGTTCAAAT CATTAAAGAT TTAGGTTCTT CTATTGAAAA TAAAGACGTA	840
	TTAATTATTG AAGATATCTT AGAGACTGGT ACTACACTTA AGTCAATTAC TGAATTATTA	900
30	CAATCTAGAA AAGTTAATTC ATTAGAAATA GTTACTTTAT TAGATAAACC AAACCGTCGT	960
	AAAGCGGACA TTGAAGCTAA GTATGTAGGT AAAAAAATAC CAGATGaATT TGTGTTGGT	1020
	TACGGTTTAG ATTATCGTGA ATTATACCGA AACTTACCAT ATATCGGTAC GTTAAACCT	1080
35	GAAGTGATT CAAATTAATT TTTAATCAA TTTGAGTTAT TATTACTATG CGTTTGAGAA	1140
	ATAATAGTGT AGACTCAAAA ATATGAAAAA TGTATTTCAT ATATATTTAA TTTTAGACAA	1200
	GACATATGTC TTGAAAAGTT GAAAAATATA GAGATTGATA AACTAATAC GGGTGTGAAT	1260
40	GACATTGATG TTAAGCTCAA TTACTAGCTT ATAAACATG TCATATGTTA CAATTTTTGT	1320
	TAGTTTTATT ATGGGAAGTA GGAGGAAATG ACGCATGCAG AAAGCTTTTC GCAATGTGCT	1380
45	AGTTATCGTA ATAATAGGCG TTATTATTTT TGGTCTATTT TCATATTTAA ACGGTAATGG	1440
	AAATATGCCG AAACAGCTTA CATATAATCA ATTTACTGAG AAGTTGGAAA AAGGTGACCT	1500
	TAAACTTTA GAAATCCAAC CACAACAAAA TGTCTATATG GTAAGTGGTA AAACGAAAAA	1560
50	TGATGAAGAC TATTCATCAA CTATTTTATA TAACAACGAA AAAGAATTAC AAAAAATTAC	1620
	TGATGCTGCT AAAAAGCAAA ACGGTGTAAA ATTAACGATT AAAGAAGAAG AAAAACAAAG	1680

55

EP 0 786 519 A2

	TTTCTTCCTA AGCCAAGCAC AAGGTGGCGG TAGTGGCGGT CGTATGATGA ACTTTGGTAA	1800
	ATCTAAAGCA AAAATGTACG ATAATAATAA ACGTCGTGTT CGTTTCTCTG ATGTAGCAGG	1860
5	GGCAGATGAA GAAAAACAAG AATTAATTGA AATTGTTGAT TTCTTGAAAG ATAATAAAAA	1920
	ATTCAAAGAA ATGGGATCTA GGATTCTTAA AGGTGTCTTA CTTGTTGGAC CTCCAGGTAC	1980
	TGGTAAACA TTACTTGCTA GAGCGGTTGC AGGTGAAGCT GGCGCACCAT TCTTCTCTAT	2040
10	TAGTGGTTCA GACTTTGTAG AGATGTTTGT TGGTGTGGT GCGAGCCGTG TTCGTGACTT	2100
	ATTTCGATAAT GCTAAGAAAA ACGCGCCTTG TATCATCTTT ATCGATGAGA TTGATGCTGT	2160
	TGGTCGTCAA CGTGGTGCAG GTGTTGGTGG CGGTCATGAT GAACGTGAAC AAACCCTAAA	2220
15	CCAATTATTA GTTGAAATGG ATGGTTTCGG TGAAAATGAA GGTATCATTA TGATAGCTGC	2280
	TACAAACCGT CCTGATATCC TTGACCCAGC CTTATTACGT CCAGGTCGTT TTGATAGACA	2340
20	AATTCAAGTT GGTGTCCTAG ATGTGAAAGG CCGTGAAGCA ATTCTTCATG TTCATGCTAA	2400
	AAACAAACCA CTTGATGAAA CGGTTGATTT AAAAGCAATT TCACAACGTA CACCTGGTTT	2460
	CTCAGGTGCT GATTTAGAGA ACTTATTAAA TGAAGCATCT TTAATTGCTG TACGTGAAGG	2520
25	TAAAAAGAAA ATTGACATGA GAGATATCGA AGAGGCAACG GATAGAGTTA TAGCCGGACC	2580
	TGCTAAGAAA TCTCGAGTTA TTTCTAAGAA AGAACGTAAT ATTGTTGCTC ATCACGAAGC	2640
	TGGTCATACA ATTATCGGTA TGGTACTTGA TGAGGCAGAA GTAGTCATA AAGTTACTAT	2700
30	TGTTCCACGT GGACAAGCAG GTGGTTATGC AATGATGCTA CCTAAACAAG ATCGTTTCTT	2760
	AATGACTGAA CAAGAGTTAT TAGATAAAAT CTGTGGTTTA CTTGGTGGAC GTGTATCAGA	2820
	AGATATTAAC TTTAACGAAG TATCAACAGG TGCTTCAAAT GACTTCGAAC GTGCAACACA	2880
35	AATCGCACGC TCAATGGTTA CGCAATATGG TATGAGTAAA AAATTAGGAC CATTACAGTT	2940
	CGGTCATAGC AATGGTCAAG TATTCTTAGG TAAAGATATG CAAGGTGAGC CTAATTATTC	3000
40	AAGCCAAATC GCATATGAAA TTGATAAAGA AGTTCAACGA ATCGTTAAAG AACAAATACGA	3060
	ACGTTGTAAA CAAATTTTAT TAGAGCACAA AGAACAAATTA ATTTTAATTG CTGAAACATT	3120
	ATTAACAGAA GAAACATTAG TTGCTGAACA AATTCAATCA TTATTCTACG AAGGTAAATT	3180
45	ACCTGAAATT GATTATGATG CAGCTAAAGT TGTTAAAGAT GAAGATTCTG AATTTAATGA	3240
	TGGTAAATTC GGTAAATCTT ATGAAGAGAT TCGTAAAGAG CAATTAGAAG ATGGACAACG	3300
	TGACGAAAGT GAAGATCGTA AAGAAGAAAA AGATATTGCT GAGGATAAAA AAGAAGCTGA	3360
50	TAAATCTGAT GAAAAAGATG AACCAGCACA TCGACAAGCC CCAAATATCG AAAAACCTTA	3420
	CGATCCAAAT CACCCAGACA ATAAATAATC GATTATATTC AGTACCTCTT TCTATGATAA	3480

55

EP 0 786 519 A2

	AATTGTTATA GCAGAAAATA ATTGTAAAAC AAGTTACTTC ATTATTTAGA ATGATGGGTG	3600
	TAGAATAAGT ACAATTGTTG CATTTTATGA AGTAAAGTAA TTTTTTAAAT ATAGAGTAAT	3660
5	AGAGGAGATT GAAATAATGA CACACGATTA TATTGTTAAA GCATTAGCAT TTGATGGAGA	3720
	GATTAGGGCT TATGCTGCTT TGACAACCTGA AACTGTTCAA GAAGCACAAA CGAGACATTA	3780
	TACATGGCCG ACAGCATCTG CTGCAATGGG AAGAACAATG caCAGCAACA GCTATGATGG	3840
10	GCGCAATGTT GAAAGGTGAT CAAAAATTAA CTGTCACTGT AGATGGCCAA GGACCTATTG	3900
	GACGAATTAT TGCCGATGCA AATGCTAAAG GCGAGGTGCG TGCTTATGTA GACCATCCAC	3960
	AAACTCATTT TCCATTAAAT GAGCAAGGTA AACTTGATGT AAGACGAGCG GTAGGGACAA	4020
15	ATGGATCTAT TATGGTTGTT AAAGACGTG GAATGAAAGA CTATTTCTCT GGAGCAAGTC	4080
	CaATTGTTTC AGGAGAACTT GGTGAAGATT TTAATTATTA TTATGCTACA AGTGAACAAA	4140
20	CACCTTCATC GGTAGGTCTT GGTGTATTGG TAAATCCTGA TAATACGATT AAAGCAGCAG	4200
	GAGGATTTAT CATTCAAGTT ATGCCAGGTG CCAAAGATGA AACAATTTCA AAATTAGAAA	4260
	AAGCAATTAG TGAAATGACA CCAGTTTCTA AATTAATTGA ACAAGGATTA ACGCCAGAAG	4320
25	GATTACTAAA CGAAATCTTA GGTGAAGACC ATGTGCAAAT TTTAGAGAAA ATGCCTGTTT	4380
	AATTGAATG TAATTGTAGT CATGAGAAAT TTTTAAATGC TATTAAAGGA TTGGGCGAGG	4440
	CTGAGATTCA AAATATGATT AAAGAAGATC ATGGTGCTGA AGCAGTATGT CATTTCTGTG	4500
30	GAAATAAATA TAAATATACT GAAGAAGAAT TAAACGTGTT GCTAGAAAGT TTAGCGTAAT	4560
	TTAATTTAAA TCAATACGCT AAAATGTTTA TTTTTCAGCG TTTAGTGAAA TGTAGAACTA	4620
	AATAGTTGTA TAATCCTTAG TGATTTTGTT TGCTTTCTAG AATTTATTTG ATAAATAAT	4680
35	TCTATATCCG ATAAATAAAC TAAGATTTC ACACTAACT AAAAAGGAGT GTTCTTAATG	4740
	GCAGAAAAAC CAGTAGATAA TATTACTCAA ATTATTGGCG GTACACCGGT AGTCAAATTG	4800
40	AGAAATGTAG TAGATGACAA TGCAGCAGAT GTTTATGTAA AATTGGAATA TCAAAATCCA	4860
	GGTGGTTCTG TAAAGGATAG AATTGCTTTA GCAATGATTG AAAAAGCAGA GCGAGAAGGC	4920
	AAAATTAAAC CTGGCGATAC AATTGTAGAA CCAACAAGTG GTAATACAGG TATCGGTTTA	4980
45	GCATTTGTAT GTGCTGCTAA AGGATATAAA GCAGTATTTA CTATGCCCGA AACAATGAGC	5040
	CAAGAGCGTC GTAATTTATT AAAAGCATAC GGTGCGGAAT TAGTTTTAAC GCCTGGATCA	5100
	GAAGCGATGA AAGGTGCAAT TAAAAAGCT AAAGAATTGA AAGAAGAACA TGGTTACTTC	5160
50	GAGCCACAAC AATTTGAAAA CCCTGCGAAC CCTGAAGTTC ATGAGTTAAC TACAGGTCCT	5220
	GAGTTATTAC AACAAATTGA AGGGAAAACT ATCGATGCGT TCCTAGCTGG TGTGGTACT	5280

55

GTTGCTATAG AGCCTGAGGC TTCTCCAGTA TTGAGCGGTG GTGAGCCAGG TCCACATAAA 5400
 TTACAAGGTT TAGGTGCTGG ATTTATTCCA GGCACTTTGA ATACAGAAAT CTATGACAGT 5460
 5 ATTATTAAAG TAGGAAATGA TACAGCGATG GAAATGTCTC GTCGAGTTGC TAAAGAGGAA 5520
 GGTATTTTAG CAGGTATTTT ATCAGGTGCT GCGATTTATG CTGCCATTCA AAAAGCAAAA 5580
 GAATTAGGAA AAGGTAAAAC AGTAGTAACA GTATTGCCGA GTAATGGTGA ACGCTACTTA 5640
 10 TCAACACCTT TATATTCATT CGATGACTAA TTAATGTCAT TTAAAAGAGT GAGTTATCTT 5700
 TTTGAGATAA CTGCTCTTT TTTTCTACCA TGTATATTTT TAAAAATATG AGCGTTAAAT 5760
 TAAACATTTT TCTGATAAAA ATATCCAGTG AATGATAAGA TAATAAACGT ACATACTAAT 5820
 15 AACTAGTAAA TAGCAGGAGT AAATTTTATT AGAGTTAAAC AATACATAAT TAAAGGGTGG 5880
 TTAACATGAC TAAACAAAA ATTATGGGcA TATTAAACGT CACACCTGAT TcATTCTcAG 5940
 20 ATGGTGAAAA ATTTAATAAT GTTGAATCAG CTATAAATAG aGTGAAAGCC ATGATAGATG 6000
 AAGGTGCTGA CATTATAGAT GTTGGAGGTG TTTCAACGAG ACCCGGTCAT GAAATGGTTT 6060
 CATTAGAAGA TGAGATGAAC AGAGTATTAC CTGTTGTTGA AGCTATTGTC GGTTT 6115

25 (2) INFORMATION FOR SEQ ID NO: 149:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 10401 base pairs
 (B) TYPE: nucleic acid
 30 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 149:

35 TAGATACTGG GnTAAaCaTc AAAAATAtyT GcTtTaTTCaC GTGTTTAcGc TCCcTCAAAC 60
 GCAACGTTAA TTGCGTGTA TcATTTAGTG TGAATTcAGA CGCTTCTTCC ATGACTATGT 120
 40 CTGATATGCC TTTTATCGAC TTTATTTTCT CTGGGTATC TAATCCTTTA AACAAAAAAA 180
 CTGCGCCGTT TGGCAATTCA ACTTTGTTAT CAGTCTTATT CCAAAGGCAC ATGTCCCAA 240
 TACCAAAGTT TATCAAACAA TCTTTAACAT CTTCGAACAA ACTATCTTTA ATTGTTGATT 300
 45 GTACTTTTCT AAGCCACAGT ATACGCCTAG GATATTCCA ATCTTGCAAT GCTTTGAGTA 360
 CAACTTTTGG TATAACGCCG TGAGACTTAC CGCTCGAACC TCCACCGTAA TGkACTTCAG 420
 TGAAGTtATC GTAATTGGTT AGTATTTCGA ATATGTTTCT APTGAAAACA TTAGACGGTT 480
 50 TGTAAAGTT TAATTTAACT TTCGTCATCG TACTCACCAA TATTAATCTC AATATTCTTC 540
 TGAGTAATTT CTTTTTATC GATATACGCA CCATGTACTT TTAGTATGTG GTCAATAGAT 600

55

EP 0 786 519 A2

	TTTAAATGGT CATATTTCTT ACTGTAAGCC TCTTGAGGTT CTCCTCTAGC AATAGAAGCA	720
	GATAACGCTA AAGCTTCTGT AATACTCATT AAACGCTCTT CTTGTATCTG TTCTAATCGT	780
5	TCTTTAATAT ATTCCGAAAC ATTAACATTT CTTAACAATC GACTTGCTAA AGACTCTGCT	840
	GTTTTCTTAC TATAACCTGC TGTAATTGCT GCTTTTTTAC CATTACATCC ATTCATTATA	900
	TATTCATCTG CGAATCTCTT TTGTTTTTCG TTCATTTTCAT TTACCACCAA CTCTCGCGCT	960
10	ATACGCTTTT TAAAATTAAA AAAGGATTGG CTATAATCAG CCAACCCACA TAGATCCTTT	1020
	ATTCCTAATT GCGATAAGGG AAACGCAGTA CGATAGTCAA TATCCTACAC TATCATAATA	1080
15	TCTCATTTAA GGTATCAAAA ACTGCCACTT TACTGCCAAT TTCAGTCTTC CCCTAACTCT	1140
	TCCGCCAATC TAGATATGAT TTTTCTTTTG ATTCTATGAG CAGTTCTATC AGAAATGTGT	1200
	ATGTCAACAC AAACCTTTCAC TAATTCCTTT TTATTAAAAT AATACTCTTG AATGAATTCG	1260
20	CGTTCCTTCC TGCTTGATGT GTTGATTATA CGTTCAATAG CGCTCTTAAA CTCAAGGATT	1320
	TTACCTCTTC GTATACTACA AAGATAATTA GTTACTGCCA TTTCTGTTTT CGATGTATTA	1380
	GACGGTACAA ACTCCCCGCC TATATTTGTA TCTGTTGGAA TCCACGGTGT CATTATTTCA	1440
25	CTTCTTAAAT CTTCAAGTTG TTTATGATAA TTAGGATAAT CACACAATC ATCTTCTAAC	1500
	TTTCGAACTG TTGATAATTT TAATCCGTAT TTCTTTTTAG TCATGAATAC CCTCCGTACA	1560
	AATATGTTTA ATCTTCAAAG TGTCTCAATC TACTTCTTAA TATCTCTATC TCTCGCTCTT	1620
30	TAACCTTTAC ATCACCTTTT AACTGTTCGG CTTGTAACAT CACACCAAAC AATAAGATGA	1680
	CTAGTAATAT AATTGCTATG ATTAACCACA TCATCTACTC CGACACCTCC GCCCTCATCA	1740
	AATCAGACTG ATCACTCAAC TTTGCGAAGT CACTTGGCGC CTCTACATCA TCATTAGCCG	1800
35	TCATCATAAT ATATACTTGC TCAGTTACAT ACTTACCTAA CTCATACATC GCTAGTAAGA	1860
	ATAATAGTCT CAAAATTTCT TTAACCACCA CTAAACACCC CATGTTAATT TATCGATAAT	1920
40	TTGTATAGCT TGTTTTAATG CGTCTCTTTT TTCTTTGATA TCTCTATTAT CGCCATCTTC	1980
	ATCAGCTGAC ATTAACCTCAC TGTCAATTC ATATAATAGT TCTGATATTT CATTACTAGC	2040
	TACTACTAAT AAGTTTTTCAT CTACATCAAT CGTTACCGTT TTCTTTGGCA TCTCCATCTC	2100
45	TCCTTATCTT AACTTGTGCC TCGTATTTGC GCTCAGCTTC TTCTTTACTC TCTGCCTCAA	2160
	CAACTGTAAA CGTCTGATTA TCTCTAGCAG TAGTAAAATG TTCATGTGGT TGTCTGTGTG	2220
	AATCTTTGAA TGTTGTGACT AAGTATTGCG TCACTTCTTA TCACTCCTTT GAATGATTCT	2280
50	AAGTTTTTCT ACGAATAAAA GTATTAGTAC AACACTCAAT GTAGCCAACA TATTTTTTTG	2340
	CTTTGCAAAA TCTACTATAA CGATTAAGAC TAATAACATT CCAATTCTGC ATGTAAATAA	2400

55

EP 0 786 519 A2

	TACAAGTATT	GGAAC TAATG	TAATGATGTA	ACTCACTTCC	CCAAAACCTC	CTTGACTCGA	2520
	TCTAAGATGT	CTTTACACTC	CGCTACTTCC	GAAGCCTTTT	TCTCCACGTT	CTGAAACACT	2580
5	TTCGAATTCC	TCCACTTGCT	TTAGTTCAGG	TGTCCATATA	GGCACGATAA	CCAATTGAGC	2640
	TAGTTTGTCT	CCTTCGTGGA	TTTGATAAGT	TCCGTATTGT	CTTATGGCGT	CACTCAAATC	2700
	GATTTCTCCT	TTAATATCAA	AAACACCTGG	TGTGATATAA	CCATTTCGATG	CAATAGCGTC	2760
10	ATTCTTGATA	TTAATCCCTA	AATTGCCGTG	ATATCCCGCG	TCTATCTTGC	CTGTTTCAAT	2820
	CACTAAATGC	GTTTTACTAC	TTACACCACT	ACGGCTAGTT	AATAGTCCGA	CATAGCCCTC	2880
	TGGTATGCTT	ACAGCTACAT	CTGTTTTAAT	CACTGCCTTT	TCTTGTGGCT	CAAGTACGAC	2940
15	AGTTTCAGCT	GAGAATATGT	CATAACCTGC	ATCCGTCTTA	TGATTTTCGTT	CGGGCATTCT	3000
	AGCATTTTCT	GATAATAGCC	TTACTTGTA	TGTGTTAGTC	ATTTTCCTGC	TCCTCCCTAG	3060
	CTGTAGCAAA	CGCTATTCTC	AATTTCAATC	TTTCAACAAT	ATGAATTAGT	GCGGTATTGA	3120
20	GGAATATTTC	AAATTCTTCA	ATGTTCTCAT	CTATAAAATC	AAGTATTTCT	TCCTCTTGTT	3180
	CACTGTCAAA	CTCGCTTAGT	ACATCCCAAA	TATTTATGTC	GCTTTTGCTC	GTTTCTAATA	3240
25	CTCTTTTGAT	TATTTCTGAA	TTACTTTTAT	TACTCATTTT	CCTTGTTTCT	CCTCATATTT	3300
	ATAGACAACT	TGACCTGCCA	TAATCCCTAC	TGCTTCATCA	AGTTCAATAC	CTTCTTTAAC	3360
	TGAATGTTGA	ATAGCATTTG	TCATTCCCTC	AAGTATTTCA	TCAAACGCTT	GTGCTCTCTT	3420
30	ATACACGTCC	TCAATCTCTT	TTAGTAATCC	CTCTGTGTCA	TTACCGTTAT	ACGCACTAGC	3480
	ACTGATCACT	GATTGTTCAA	TTTGTTTCGCG	GTTATTCATC	ATTTCCATCT	CCTCTAAAT	3540
	AAAGTTAGTT	GCTTCTGCTC	CTCGTATTCC	AAACCATGTT	GCTTTATATA	TGTTTCGAGC	3600
35	TCTTCCGCTG	TATCAAATGT	CTTTTTCACG	CCTTGCCAAC	CTGGCACGAT	ATGCCCATGa	3660
	AAGTAATAAG	TGCCGTTTAC	TACATGGATA	TGTGCCACTC	GTTTCGTTATC	CTGATACAGA	3720
	TATCTCTTAG	ATCCGAAAAA	TTGGTTTAAG	TATTCCTTAC	ATGCGCTATC	GGTTTTAGGC	3780
40	ATTTATGCTT	CCTGCCATTT	CTTAAACATT	TGGTTATAAG	TAGTATCAAA	CCAGTACGGA	3840
	TCACGTGAAT	GTTTTTGAGG	CACATTAAAC	AAATGTGGCT	TCTTCTTACG	TAGTTCAGCC	3900
	TCTTTACGTC	GTTGCCTAGC	CATTTCACGC	TCTTTGCTCT	CTCGCTCCAT	GATTTTGGAT	3960
45	AACACAATTT	CTTTATACTC	AGCTAAGCGC	ATACCATAAG	GTGCATGTAA	GGCTTCTAAC	4020
	AACGCCCAGC	CACCTCGTAC	TCTTTTTCGA	ACCATTCTCTG	GAGTTAAACC	GTTCTTTTTT	4080
50	ATCAATTTCAT	TTTCATGTTT	GGTAAATTTA	TATGGTTTAC	CGTTAATCTT	TACGATACTC	4140
	ATTTATTCCA	CCTCTATACA	TTTACTTTTT	TTAATCCAAT	CCTCTAATTT	GTGCGTGTG	4200

55

EP 0 786 519 A2

ACATTTAAGT TAACCATCTC AGCTTTTCCG TTTTATATC CACTAATAGT TGATCTTGAT 4320
 ACGCCAGTTT CATTGTGCAA ATCTTGGACA CTTACGTTAT CTCTAGCCAT GATTACCCTT 4380
 5 AAATTAGTTG CGAATACTTC GTTCAACTTC ATTTATTCCA CCTCTATATA TGCATGTCTT 4440
 ATTGTTATGT TGTCATACTT TAGTAATTCG TCCGGATTGT CATCTAAGCG CTTTGCCAGC 4500
 GTATCTTTTT CTTTATCCAC ATCATCGTAA TGCTGATATT CAACTTCTGT AGGTATTCTT 4560
 10 ATATCAATCG TTGCGTTTAT ATATGCTTGT TGTTCATTA GATCACTTCA TTTCTCTTTT 4620
 TCTTTTACGT CTGACTTTCA CTAAGTCTC ATATACCATC CATTCTTGAC CTGTGTATTT 4680
 AGGCGCTTTA CATATCCACG TTAAATTCAC ATCTCTATAC TGATATCTGA ATATCTTCGC 4740
 15 TTTGATGTTG GCAACTTCAG TCGCCTTACC TTAAACGTCT ATAACITCAA CCAGTTTCCC 4800
 TTCCTTCCAC AAAGAGAAAT CGGCTATATA CGTAATCGGT CTTTGTITCC CGAATTTAGG 4860
 TTGTAATTC AATTTGCGTT GTATTTGAT ACGATCATAG TTAGTGCCAT TCATATTACT 4920
 20 TTCTAAATAT TGGTAATATT CGCACTCTAC TTTGCTATCA AATACAATTC CTTTGTACTC 4980
 AACTTTCTTA GCATTGTATT TACTCATTGT GCCACCTCTA AATATCAAAT ATCGTTGCTT 5040
 25 GCAATCCTAG CTCTTGCTCA TATAGAAGCC CGTGAGCGCC TTTGAATCGT TTTAGGTCAC 5100
 TATCAGTCAT AATTTTCTTT TCGTCGCTGA AATGGGCTCC TGTGAGCGAA TAAACTTCAT 5160
 TTACGTTGTC TTTATACTTG ATGACCTTAA TATCTTCCGT GCCATCTTCT CGGTATAAGT 5220
 30 AATATTTTTC TTTGCGCATT TTTAACAAT CCTTAATGTG TGTITCTTTC CAGTTGATTT 5280
 CATTGATGAT TTTCTTTTCA ACTCTGTCGT AATCATCGAA AGGCGATAAC TCGTTATTGT 5340
 CCAACAATCT ATTGACCGCC CAACCAGTCT CGATATATAC ATTTGCTACA ATCGGGTCGC 5400
 35 TTTGCTTGT CTCTTCATAC ATCGATTTCATAAAGCTTTT GAATTGCATT ATATTCATGT 5460
 GAAAACCTC TGAGTCTTCT TGTAATACTC AAATTCAATT ATTCCGGTTT CGCCGTCTTT 5520
 GTTTTGGCT ATGTTACATT CAACAATAGA TTTGCCAGTG ATACTGTCAT CTTGTCACG 5580
 40 GTTATAATAA TCATCACGGT AAAGTAGCAT CGCTAACTC GCATCTGCTT CTATTCCGCC 5640
 TGATCTTTC ATGTCCGATA GCATTGGTCT TTTATCCTGT CTAGACTCGA CACCACGATT 5700
 CAGTTGTGAA AGTAGTACGA TGATTGCGCC TGTCTCGTTA GCGATTATCT TTAAGTCACG 5760
 45 TGATATCTTT TCTACTGCTA CACGTCTATC AACTTTCGCA TCAGTATCCA TCAGTTGAAG 5820
 ATAATCTATA AAAATAACTT GTTGCTGTC TGAATGCCTC ATTGTGCGC TCGCACATCT 5880
 50 TCGGGTGTGA TATTACTTTT ATCAGAAATA TCGATGCCTA ATTTGATGAT TTTATCCATC 5940
 GCATTCGTTA ACTTGTGTTA GTCATCCGGC GTTAAGTTCC TGATTTCTTT TATCTTTGTT 6000

55

EP 0 786 519 A2

	AGACTAAAGA AAGATGTTTT GSTATCCATT TGTGCTATGT TCAGCATCAT GTTTAATGCA	6120
	AAACCTGTCT TACCCACTGA GGGACGCGCT GCGATGACGA TTAATTGTGA TGGTTCTAAT	6180
5	CCCCCTATTT TGTAATCCAT TAGCTTGTA CCCGCTCTAA TTTGCTTCTT AGGGCTATCG	6240
	CTGTATAACT CTCGACAAA CTCCTCAACA AACTTCTTGG TTCCATCTTC TTTTTTGTTA	6300
	GTAATTGTTT TTAAATCCTT GAGTTCATCA ATCAAGTTGT TAAAGTTTTG GTTCGTAGGT	6360
10	TGTTGTTTGA ACTCAGTTAC CAATTCGTTA GCTTTGTGTA GCTGATAACT TTCCAATAAT	6420
	TCTTGTTGAT AACGTTCAAA GAAGCCATAT CCAATGAAAT CGGAGTTGTA AAGTTTAGTT	6480
15	ATAGTATCTG CATCTAAAAA TTCTTTATCT TTAGTTGCTT TTAAATAGAT TTCTTGATGA	6540
	TCTATCTTTC CGACGTCCAT TACATAATTG AAAAAGGTTT TAAACTTTTC GTTCGTAAAC	6600
	ATGTAATCTT TAACTCTTAT CTTTTCTAAT ACGTCCGGTT GTTTAAGTAG CGTAGCGATT	6660
20	ATTGTACTTT CAATTTGAA TTGTCCGTAA TTCATTCGTT TCGCCCCCA AATTCTGCCA	6720
	ACTTATTCAT GAACCTATCT AGCGCTATTT TTCTTTGTCT GACATATTCG GGGTCATTCT	6780
	GCATTTTCCA TTGGTGTGTA GCGGTTTCGT TATCTACTGG CTCGATAGAT ACTTTTTTAG	6840
25	GTTCCTTACG CATGATTGCT GGTAAGTTAG GCGGGTACGG GTTGTTACTG TTGATATAAA	6900
	CATCTACCGC TTTTACAGTT GGTTGATAAT CTCCATTTTG ACTTAATACA TCAATCCACA	6960
	TTTCTAACTT CGGTTTATCA AAATCAATGT TGTATACGTA CCTAACTTTT TTAATAATTT	7020
30	CTAATGCTTG TGTTTTGCTC ATCGGCATTA GTCATCACTC AATTCTTTTT CCATTTGTGC	7080
	AATGACATCA TCAGTAGTAT TTTTCTAGG TGCTATTTTA TTTTCTGCAT CTTCTTTTGT	7140
	TTTGACATTC TCTTTAGCCC AGTTGTTTAA AACTTTAATT AAATAGCCAC CATGCGCACT	7200
35	TTTGCTTTTA GTGACTCAA CACCTACTTT TACAACCTCA AAAGCGTTTG TACCTATATC	7260
	ATCAATAGCA AACCTAATT GTTCCATTG ATTAGGTGTT AACTTATCAT CCAAATTGTC	7320
40	AATTATATAT TTTATTGAAG ATGAGAAGAC GGCTTCTCTT TCTTCTTCTT TATTCTTATA	7380
	TTCTTCTTCT TTTTCTTCTT CTCTTTCTTC TTCTTCTTCT GTATCGTTAC GTAACGTTAC	7440
	GGTAACGTTA CGTTTTGCTT CTAGTAACTT TTTCTGTTTC TCACGATAGC GTTGTGTGCG	7500
45	CAATTTATTT TTTTCTTTAT GCTTAGCTTT GCTATCTAAG CTTTGATGCT TCTCCCACTT	7560
	TGTCACTTTT ATGACACCAT TAACTTTTTC AATCATGCCC AATGTCTCAA AAGTTTGAAT	7620
	TGCTAACCTT ATTGAGTTAA TAGGTCTATT AAATTCATTT GCTAACATTT CTTCGTTGTA	7680
50	CGGCAAGTTT TCGGATAGCA TAATATAACC TTGTTTATTG TACTTTCCTG ATAAAGTTAG	7740
	TAACTTAACC CAAATAGTTA TGATCGTATC TCTTTCGGGT AAAGCTTCGA TATATTTGAT	7800

55

EP 0 786 519 A2

	CTCCTTTCAG CATTTTGTG AGCCTCTCAT CAACTTTAT CCACGAGTCA TGCAAGTGAT	7920
	ATTTATCATC AAACGACTTA ACGCCAATTG CGTGCTGTTC ATTATGATGT TGTCTACACA	7980
5	GTGCTAACAC ATGTTTGTG TAGTGATTCA TTTTGTCTT GTTCATGCCT CTGCCGACTG	8040
	CTTCATAATG TGCCAGGTCT GCGTGAGGCT TTCCGCATAT TACACAGTTG CGGTTGATTG	8100
	TAGCCCAATA TAATAACGCT TTATCTTCGC TTAACAACTT ACTCGTTTCT AACTCATAG	8160
10	GTATTTGATG ATGAAACATA AACGCTATAA TCAGTTCTAT TAACTCCCTT GCAACTTTCA	8220
	TAGAACAGTC GCGCAGACTG ATTTCTTCAT AACCTTTCAT AATTTCCAAT TCTGTTTGTA	8280
15	ATAATTTTCT AGTTGATTCT ACTGGTTCGC CCCAGTGAAG TTCTATATCT CTACACATTG	8340
	CGAATATTTT TTGCGTTGT TCTATAGATA GTTTTATT GTCCGGAACC TCTACTTCTG	8400
	CTTTAGTGG ATATCCGTTT TCTAGTAAGT CAATGTGACT TTGTTCAAGT TCAACACCAG	8460
20	TAGCAACGAC GGAATAAGTA CCGTCATTGT CTTTCTGGTA TCTTGTAATG TATTGCATTT	8520
	AAACCACGTC CTAGAACGGT AAATCATCAT CATTGATTTT TATTGGACCA TTAGCATTAG	8580
	CGAATGGGTT TGATTGTTGA CTCATTGGCG TCTGTTTCCC ATTTGCTTGC TGTTCTTTTT	8640
25	GTTCATCTC ATCAGTTTTA GGTTCGTGTT TATTAACATC TTCATCGTCT TTATTCCAAA	8700
	CTTTTACATA TGAGAGTCTT ACAAATACT TGCCTTGTTT CTCGTTAAAT TTATTTTAA	8760
	GTACAATAGT TCCGATTTTG TTAATTAATT GATCTGTGTC AAAAGTTAAA TCTGGTAAGT	8820
30	TCAATTTAAT TCCTAATCTA CTAAGTAACT CGATATATTG TTTTCTTGA TAATCTTGTT	8880
	GGAATGGTGG GACGAATTGG TTGTGTTGT ATTGTTTACC TTCGTTGTTT TCAAAAACAA	8940
	TCGTGAAGTA TCTGTTTTCT CTGTCGTAA ACTCGACATT TGCAACTTTT ACTGTAAATT	9000
35	CTCCAGCTCC TAAAAAGTCC CCACCTTCA TGAATGCCTC TTGATTAGTT TCTTGAATGT	9060
	ATTGTGTTCT ACCAGTGATT TTCATAATTT TTATACCGTC CTTTAAATTA ATTTTAAAT	9120
40	ACCATTTCTA ATTGCTTGTA CAACATCGTT AATACTTGA TTAATGAAAC GTTTGTTGTT	9180
	AATTTTGATG TTGCTTGAGT GTCTTATCTT TGTCTCGAAT AAATTTGATG GTTCAGCGTT	9240
	AAGTACATAT TGATAAGTTT TTTCGCCGTC TTGCTCATGT TCTTCTATTG TCATTCTTGC	9300
45	TAACACGTCA GATTGACTGA TGAAGCTTT TTTATTTGG TCTTGTGCCT CTATCGTGAT	9360
	TGTTGGATTG ATAGTACTTC CCTCATCATC TTGTCTTTG TTAATGCCCT CGTGTCCGCT	9420
	TATAGCAAGA TGAAATTGAT AATGTTCTTG TAATTTAGAA ATATAACGAT AAATACTTAC	9480
50	AATGCGTGTA GCACACTCGC CCCAATCATT AAATGTCGGT TTCTTTGATT TACCGTCCAT	9540
	GATGTCGTCC ATAGTGATAT CACGTAACCT TTGGATTGTT TCAATCACTA CAACATCAAT	9600

55

EP 0 786 519 A2

AAAATGCTTA TAATTCTTAA TCTGCACAAC TGCCCCATCT TCTGTTACCG TTGTTCCGTC 9720
 CTCATTTATA TCTAGTACTA AGGCATTGTT ATCTTTTGTT AAAAAACGTAG TTTTACCAGT 9780
 5 ACCGAACTTG CCGTATATCG CAAATTTATA AACTTTGTTT GCATTTTGTT TGCTGATGTC 9840
 TTTTACACCT AGTTGCGTTA AAATATCGAC ATCTTGATTA GTTTTTTCAG TCATCTATTC 9900
 TCCCACCTTT ACCGTGTATG ACGTTGGTTT CTCCACAATG CTAGCACCTT CTAAACTTC 9960
 10 GCCGTTTGCG TCAATCAATG TGCCGTTTTC AGTTACATTG AAATCTTTCT TAATGTCTGA 10020
 TTGGCTAAGT TTTTGTAGTA CTTTACATA GTTGTCAAAA CCTCGTTGCT CAAGTTGtT 10080
 AATGACTTCT TGCTCATTGC TAACCTGAAT GACTTTTGAA CCTTTTCTGG CTGTCACATT 10140
 15 TCCGTAAGtG TATTCAACTT GAATTTGCTA TCTTGTTCTT TTTGTATTCT GTAATATTCA 10200
 ATTACAAGGC TTTGTAAATA TTCTTTGCCA CTCTGTAATT TTTCTACTTC TTTATCTTTC 10260
 CATTCGTTTA TGC GTTCAAT TTCTTTATTT GCTAAATCGT TGATTTCAAT CTCTTTAGTT 10320
 20 GTGATTGCAT CCAGTTTCTn AAAAACCAG TTAGCACTGT CTAGATCAGT nACTTTGAAT 10380
 CGGTCGTCTT GTTCGAATGT n 10401

25 (2) INFORMATION FOR SEQ ID NO: 150:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 2989 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 30 (D) TOPOLOGY: linear

35 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 150:

TTTCTCTCTA TTATTCTCGA TGC GTAGATA ATTGTTTAAA TTAAAGTTTA TAGTAATGTT 60
 GAGTTTATAA TTT CATATAT CTAAAAACAG GTGTTGTATA TATAATCATT CATCTAGTTA 120
 TACTTACTTT AAAAATAATA TAATTTCATG CGATGCAATT CATTGATGGA TGTTTTTAAT 180
 40 CTTAATCAAA TCCAaATAAA GCATATATTT TTAAATTCAC TTTCTTTTCA ATCGATTTTT 240
 ATCTCTTGnA TTAAACTTTT CCATTGTTTC ATTAAAGCTC TCTGTCATAT CTATTCCCAT 300
 TGAATTCGCT AAACATAACA ACACAAATAA ATTATCACCT AATTCTGCTT TAATCGTATT 360
 45 TGCTTCCTCT GAATCTTTCT TCTTTTTTTC ACCATAGGTA TGATTTATTT CACGTGCAAG 420
 TTCGCCCCACT TCTTCAGTCA ATCTAGCTAA GTTAGCTAAT GGTGAAAAAT ATCCTGTTTT 480
 50 AAATTGTCCA ATATATTCAT CAACTTCACG TTGCATTTCT ACCATTGATT TCATTTCTAC 540
 GTTCTCCTTA TATTGCATTT CTAATATAGT ATATATCAAT TTGAAGTCTC ATGCATGTTT 600

55

EP 0 786 519 A2

	AATTCAGTTT ATATAAATGT AATGCATTCC TAACTAAATT AAATCAATTG AAATTGGGAT	720
	TATAACTTTA TGATACGTAC CACTACAATA AAATAATATA GTGAATAATC TACCATTAGA	780
5	AAAATAAGCA CAAAAAACT AGCAACCACA CAAAAATGTG ATTAGCTAGT TAATAAGTGT	840
	CTAATTTAAG TTAATTGTTA ATCTATAAGA TTAATCACTT GAACGCGCAA TCAAAATAAT	900
	ACGTACAAGC TCTGCTACAG CGACTGCAGT TGCTGCAACA TAAGTCATTG CTGCTGCAGA	960
10	TAATACTTTA CGCGCATGCT TGTATTCTTT TTCATTTACA ATGTTCAATG CCGTAATTTG	1020
	TTTCATCGCT CTTGAACTCG CATCAAATC AACTGGTAAC GTAACAATTG AGAATAATAC	1080
15	CGCTAATGAC ATTAAACCAG CACCAATCCA TAAAGCAGTT GAACCAaATG CACTACCTAT	1140
	CGCTGTTAAG ATAATACCTA ACATGATGAT CATATAACTT AATGAACTCC CTAGGTTTGC	1200
	AACAGGTACT AATGCTGCTC TGAATCTTAA GAACCAATAT CCTTGGTGAT CTTGAATGGC	1260
20	ATGACCAACT TCGTGGGCTG CAATTGCAGT TCCAGCAACT GATGGTCTGT CATAGTTTGC	1320
	AGGAGATAGT GAAACAACCT TCTTTTtagg ATCGTAATGA TCTGTTAAGA ATCCTTCACC	1380
	TTTAACAACCT TCGACATCAT AAATACCGTT TGCAATGTAAT ATTTCTAATG CAACTTCACG	1440
25	ACCCGTTTTA CCACTAGTTG ATCTAACTTG TGAATATTTC TCATAGTTAG ATTTAACTTT	1500
	GTGTTGTGCC CATAAAGGAA GCACCATTAA TATTACGAAA TAAATTATCA TAGTAAAAAT	1560
	TGAAGACAAT AAACCTCACTC TCCTTTATAA ATATTTTACT GTCATTTGCC GTTTTTATCA	1620
30	AATCATTTAC ACTTTAATAA TTTGTTTAAT TCAATATAAA GCAAAAGTCC AAAAACACTT	1680
	AGACAACATG ATAATACACC AATTTGCCAC ACATGTGTAG TTATAAAATC ATAATATGGA	1740
	AATTGAAGGT GAAAATAGTC AATATAATCA TTCAAAAACA CCCAAATCAT yGCTACACTG	1800
35	ATTCCAATCA TAGAACGTTT AAACCTAGGA TAGAAGTAAA TTGCCTGAAC AGCCATTATA	1860
	CTGTGGGAAA ACATTAATAC CAAACCATTT ACTGTAATAT CACCTTGTTT AATAATAAAT	1920
	AATATATTCA TTATAACTGC CCAATCCCA TATTTGAATA ATGTTACAAA TGCCAGTGCA	1980
40	TCGATAATAC TATTTTGTTT TTGAATTAAT ATCAATGAGA TAGAAATAAC TAAGTATAAT	2040
	ATTGCAGTTG GGCTATCTGG AACAAAAATC TTAAAATGCC AGGGCGTATG ACTTAATTGT	2100
45	TCACCATACC ATATATAACC ATAAATCATC CCTAATATAT TACAAATGAG TAGCATCATT	2160
	AACCAAGAAC GTTGATAAAG TGTATATTGC CAAATGCTT TAATTGTCAT CTGCTAAGTC	2220
	CTCAAATTGA TTATGTTTAT TTAGTAGCTT GAGTGTATTT AAAATTTGCG TTAGTTGATA	2280
50	AAAACGTTGC TTTTCATTCA TCTGTAACT TAAATCAATA TTGTGTAACA AGTAATCTAT	2340
	TAATAACGCA TGTTTATGCC GATCTATAGC CATACTATTT AAGTCATGAA GATAAGTTTG	2400

55

EP 0 786 519 A2

	TGACACGTTT GCGAAGTGAA TTTGAATATC AAAAGCACAG TTATGATTAG CGATATAATC	2520
	AAATATTTCa TTTGTATTCA TTAACCTTAT ATTACGCTTA GTAAATTGAA TTGCAGAAGC	2580
5	GTGACTTCCC ACTTCTGCAA TTTCTAATGT TTCATGATGA TTAATTTTTG TATCTACAAA	2640
	ATGAATGTTT GCCAATTTTCG CCTCATTAC TTTTATATAG TTAAGCACCC AACTTGCAAT	2700
	ACGCGACTTA AATCGATATT GAAAAAGTAA ATATTCAATA AACTTTTCTT TAATTTGATT	2760
10	GAGTGTCTCT GACATCAAAT ACCCCATTTT AAGATTGCAA TCTTGaTAAT TCGTCATGCC	2820
	AATTTTCGTT ACTTGGcTCT AGTTCCAACA ATTGATTIAA AATAGTAATT GCTTGTTCCT	2880
	TTTGACCAAT TTCAATTAAA TAGAAATAAT AATCACTCAT AAAATCAATA TTTGTTTTCA	2940
15	TCGTTGGATA TGCTAATTCA AAGAAATGTT GAGCTTCTTT ATCTCGCTC	2989

(2) INFORMATION FOR SEQ ID NO: 151:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1143 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 151:

	CATCAACTCC TTAATTACAC TGTAATGAT ATGCGTCTTT TTGACAACTA TATTTGTCAA	60
30	ATCTACACCA AAAAATATGA TTATCCACCT ATGTATGACA TTTTGAAACA AACACCTCAA	120
	CGCCTACAAG TCATAATTGT TTAATTTTCGT TACACCTTCC TGCATAATTA ACAGCATTCT	180
	AATTTTAGTA TGATGCACGC ATTTTCACTA AATCAAACCA TTCAAAGGAG ACTATTATGG	240
35	CATTTACATT ATCTGCAATT CAACAAGCAC ATCAACAATT TACTGGTGTT GACTTTCCAA	300
	AACTATTCAA AGCTTTTAAA GATATGGGGA TGACTTACAA TATCGTCAAC ATTCAAGATG	360
	GCACTGCAAC ATACGTACAT CAATCAGAAG ATGATATCGT TACGTCATCT GTAAAAAGTA	420
40	ATCATCCTGT TGCTCAAAAA TCAACAAAA CAATAGTTCA AGACGTCTTA ACTAGACATC	480
	AACAAGGGCA AACAGATTTT GAAACATTTT GTGATGAAAT GGCTGAAGCT GGCATTTATA	540
45	AATGGCATAT CGATATTCA GCGGGCACTT GTACTTATAT CGACTTGCAA GACCAAGCTG	600
	TTATTTTCAA ATTAATCCCT CAATAAATA TATTTATAGC AACATTTTAA TTATTTTATA	660
	AAATTTTATT GATAATCATT ATCGTTCGGT ATAAAGTAAA TACTATATAC TACTTATGAG	720
50	TGAGGTTGAT TATCATGATA ACTAACACTT TTATTTTAGG CATCACAGGC CCAACAAGTC	780
	TTGTCGTCAT TAGCATTATC GCTTTAATTA TTTTGGTCC GAAAAAATTA CCACAATTTG	840

AGTCTCACGA TACACCCAGT AAGGAATCGA AACAAACAGCG AGAGCAATAG CACTGACCAC 960
 ACCTTACTGG TTCACCTTTAG CGAACTACGC CATCGGTTAG TAAAAATTTT ATTGTCGTTT 1020
 5 GTCATTACGG TCATCGTCGT ATATGTYTCA TCATTTTGGT GGATGACACC ATTCATAACG 1080
 TATATyACCC GgCACATGTG TcCTTACATG CATTTCATTc ACAGAAATGA TACAAATAAC 1140
 GTG 1143

(2) INFORMATION FOR SEQ ID NO: 152:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7953 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 152:

CAACGCCTGA ACGTAAACCA TATCGTTTCG CGATTTCTC ATCTTGACTA TTTACTAAAA 60
 ACTCTCTCAT GCGGATTAAT GTTCTTTTTT CTTCTTTAGT TAATGGTAAT TCTAACTCAG 120
 25 CTGCTTTTTG ACGCAAAGTT GGATGACCAT CTCTAATGAT GTCTTTCATT GTTAACATAT 180
 ATTGCACCTT CCTTATTTTA ATTTGTTTTA GTTGAATGAC AGTAAAAAGG TTGTTAAGAT 240
 ACTCATACAT TTTTATGTGT AAATATCTAC AAAGTTAACC AACTACTGCC AATGTTTATT 300
 30 TTAGATAGTA TATGTAAATT TTCAaGATaT GCgTAATTGC gTTAAAAAAT GaTTAAAGTG 360
 TTGGTTTCAA GCAATGaTAC TTTAGAAATT TATTTATCAT CTTGACTTTA AAAATTATAT 420
 TATAAATGAC GTAACGTGCA ACAGATATAC TTAGTAaTGA AGATGTGTAA TGTAATTGTT 480
 35 TAAAATTGAT TTCCAAGCAG ATTTTATTTA TCATTTAATT TAAATAGCAA GTGGAGGTAC 540
 AAGTAATGAA ATTTGGAAAA ACAATCGCAG TAGTATTAGC ATCTAGTGTC TTGCTTGCAG 600
 GATGTACTAC GGATAAAAAA GAAATTAAGG CATATTTAAA GCAAGTGGAT AAAATTAAAG 660
 40 ATGATGAAGA ACCAATTAAA ACTGTTGGTA AGAAAATTGC TGAATTAGAT GAGAAAAAGA 720
 AAAAATTAAC TGAAGATGTC AATAGTAAAG ATACAGCAGT TCGCGGTAAA GCAGTAAAGG 780
 45 ATTTAATTAA AAATGCCGAT GATCGTCTAA AGGAATTGTA AAAAGAAGAA GACGCAATTA 840
 AGAAGTCTGA ACAAGACTTT AAGAAAGCAA AAAGTCACGT TGATAACATT GATAATGATG 900
 TTAAACGTAA AGAAGTAAAA CAATTAGATG ATGTATTAAA AGAAAAATAT AAGTTACACA 960
 50 GTGATTACGC GAAAGCATaT AAAAAGGCTG TAAACTCAGA GAAAACATTA TTTAAATATT 1020
 TAAATCAAAA TGACGCGACA CAACAAGGTG TTAACGAAAA ATCAwAAGCA ATAGAACAGA 1080

EP 0 786 519 A2

	AAGAAAAGCA AGACGTTGAT CAATTTAAAT AATTAATATA ATACAGATGG TAGGAAACAA	1200
	CTAATACAGT TCCTATTATC TGTATCTTTT TTTATTAAAA CAGAACTTTT TCAAATGGTT	1260
5	TAACAGTCCC ATTTATTTGT GGTACAATTA GTAAGGATAA AATGAATTTT TATACAATTA	1320
	TGGGAAAGGT ATTGTGAATT GAATGGCTCC TAAGTTACAA GCCCAATTCG ATGCAGTAAA	1380
	AGTTTTAAAT GATACTCAAT CGAAATTGTA AATGGTTCAA ATTTTGGATG AGAATGGTAA	1440
10	CGTCGTAAAT GAAGACTTAG TACCTGATCT TACGGATGAA CAATTAGTGG AATTAATGGA	1500
	AAGAATGGTA TGGACTCGTA TCCTTGATCA ACGTTCTATC TCATTAAACA GACAAGGACG	1560
15	TTTAGGTTTC TATGCACCAA CTGCTGGTCA AGAAGCATCA CAATTAGCGT CACAATACGC	1620
	TTTAGAAAAA GAAGATTACA TTTTACCGGG ATACAGAGAT GTTCCTCAA TTATTTGGCA	1680
	TGGTTTACCA TTAAGTGAAG CTTTCTTATT CTCAAGAGGT CACTTCAAAG GAAATCAATT	1740
20	CCCTGAAGGC GTTAATGCAT TAAGCCCACA AATTATTATC GGTGCACAAT ACATTCAAGC	1800
	TGCTGGTGTG GCATTTGCAC TTAAAAACG TGGTAAAAAT GCAGTTGCAA TCACTTACAC	1860
	TGGTGACGGT GGTTCCTCAC AAGGTGATTT CTACGAAGGT ATTAACCTTG CAGCAGCTTA	1920
25	TAAAGCACCT GCAATTTTCG TTATTCAAAA CAATAACTAT GCAATTTCAA CACCAAGAAG	1980
	CAAGCAAACCT GCTGCTGAAA CATTAGCTCA AAAAGCAATT GCTGTAGGTA TTCCTGGTAT	2040
	CCAAGTTGAT GGTATGGATG CGTTAgcTGT nATATCAAGC AACTAAAGAA GCACGTGACC	2100
30	GCGCagTTGC AGGTGAAGGT CCAACATTAA TTGAACTAT GACATATCGT TATGGTCCTC	2160
	ATACAATGGC TGGTGACGAT CCAACTCGTT ACAGAACTTC AGACGAAGAT GCTGAATGGG	2220
	AGAAAAAAGA CCCATTAGTA CGTTCCGTA AATTCCTTGA AAACAAAGGT TTATGGAATG	2280
35	AAGACAAAGA AAATGAAGTT ATTGAACGTG CAAAAGCTGA TATTAAAGCA GCAATTAAAG	2340
	AGGCTGATAA CACTGAAAAA CAACTGTGA CTTCTCTAAT GGAAATTATG TATGAAGATA	2400
40	TGCCTCAAAA CTTAGCAGAA CAATATGAAA TTTACAAAGA GAAGGAGTCG AAGTAAGCCA	2460
	TGGCACAAAT GACAATGGTT CAAGCGATTA ATGATGCGCT TAAAACTGAA CTTAAAAATG	2520
	ACCAAGATGT TTTAATTTTT GGTGAAGACG TTGGTGTTAA CGGCGGTGTT TTCCGTGTTA	2580
45	CTGAAGGACT ACAAAAAGAA TTTGGTGAAG ATAGAGTATT CGATACACCT TTAGCTGAAT	2640
	CAGGTATTGG TGGTTTAGCG ATGGGTCTTG CAGTTGAAGG ATTCCGTCCG GTTATGGAAG	2700
	TACAATTCTT AGGTTTCGTA TTCGAAGTAT TTGATGCGAT TGCTGGACAA ATTGCACGTA	2760
50	CTCGTTTCCG TTCAGGCGGT ACTAAAACTG CACCTGTAAC AATTCGTAGC CCATTTGGTG	2820
	GTGGCGTACA CACACCAGAA TTACACGCAG ATAACCTAGA AGGTATTTTA GCTCAATCTC	2880
55		

EP 0 786 519 A2

	CTATTAGAAG TAATGACCCA GTCGTATACT TAGAGCATAT GAAATTGTAT CGTTCATTCC	3000
	GTGAAGAAGT ACCTGAAGAA GAATATACAA TTGACATTGG TAAGGCTAAT GTGAAAAAAG	3060
5	AAGGTAATGA CATTTC AATC ATCACATACG GTGCAATGGT TCAAGAATCA ATGAAAGCTG	3120
	CAGAAGAACT TGAAAAAGAT GGTATTCTG TTGAAGTAAT TGAATTACGT ACTGTTCAAC	3180
	CAATCGATGT TGACACAATT GTAGCTTCAG TTGAAAAAAC TGGTCGTGCA GTTGTAGTTC	3240
10	AAGAAGCACA ACGTCAAGCT GGTGTTGGTG CAGCAGTTGT AGCTGAATTA AGTGAACGTG	3300
	CAATCCTTTC ATTAGAAGCA CCTATTGGAA GAGTTGCAGC AGCAGATACA ATTTATCCAT	3360
	TCACTCAAGC TGAAAAATGTT TGGTTACCAA ACAAATGA CATCATCGAA AAAGCAAAG	3420
15	AACTTTAGA ATTTTAATAC ATTTTAAAAG TTAACGAAGT TAGCGTATTT TAGTCTCATT	3480
	GATTAAAATG AAATGTTTAA TTTACGAAAT CTTAGGAGGG CAAAACGTG GCATTTGAAT	3540
	TTAGATTACC CGATATCGGG GAAGGTATCC ACGAAGGTGA AATTGTAAAA TGGTTGTTA	3600
20	AAGCTGGAGA TACTATTGAA GAAGACGATG TTTTAGCTGA GGTACAAAAC GATAAATCAG	3660
	TAGTAGAAAT CCCATCACCA GCATCTGGTA CTGTAGAAGA AGTTATGGTA GAAGAAGGTA	3720
25	CAGTAGCTGT AGTTGGTGAC GTTATTGTTA AAATCGATGC ACCTGATGCA GAAGATATGC	3780
	AATTTAAAGG TCATGATGAT GATTCATCAT CTAAAGAAGA ACCTGCCAAA GAGGAAGCGC	3840
	CAGcAGaGCA AGCACCTGTA GCTACTCAAA CTGAAGAAGT AGATGAAAAC AGAACTGTTA	3900
30	AAGCAATGCC TTCAGTACGT AAATACGCAC GTGAAAAAGG TGTTAACATT AAAGCAGTTT	3960
	CTGGATCTGG TAAAAATGGT CGTATTACAA AAGAAGATGT AGATGCATAC TTAAATGGTG	4020
	GTGCACCAAC AGCTTCAAAT GAATCAGCTG CTTCAGCTAC AAGTGAAGAA GTTGCTGAAA	4080
35	CTCCTGCAGC ACCTGCAGCA GTAACATTAG AAGGCGACTT CCCAGAAACA ACTGAAAAAA	4140
	TCCC ¹ TGCTAT GCGTAGAGCA ATTGCGAAAG CAATGGTTAA CTCTAAGCAT ACTGCACCTC	4200
	ATGTAAACATT AATGGATGAA ATTGATGTTT AAGCATTATG GGATCACCGT AAGAAATTTA	4260
40	AAGAAATCGC AGCTGAACAA GGTACTAAGT TAACATTCTT ACCTTATGTT GTTAAAGCAC	4320
	TTGTTTCTGC ATTGAAAAAA TACCCAGCAC TTAACACTTC ATTCAATGAA GAAGCTGGTG	4380
45	AAATCGTTCA TAAACATTAC TGAATATCG GTATTGCAGC AGACACTGAT AGAGGATTAT	4440
	TAGTACCTGT TGTTAAACAT GCTGATCGTA AGTCTATTTT CCAAATTTCA GATGAAATTA	4500
	ATGAATTAGC TGTTAAAGCA CGTGATGGTA AATTAACAGC CGATGAAATG AAAGGTGCTA	4560
50	CATGCACAAT CAGTAATATC GGTTCAGCTG GTGGACAATG GTTCACTCCA GTTATCAATC	4620
	ACCCAGAAGT AGCAATCTTA GGAATTGGCC GTATTGCTCA AAAACCTATC GTTAAAGATG	4680

55

EP 0 786 519 A2

	ATGGTGCAAC TGGCCAAAAT GCAATGAATC ACATTAAACG TTTATTAAAT AATCCAGAAT	4800
	TATTATTAAT GGAGGGGTAA AACATGGTAG TTGGAGATTT CCCAATTGAA ACAGATACTA	4860
5	TAGTAATCGG AGCAGGTCCT GGTGGATACG TTGCAGCAAT TCGTGCAGCT CAATTAGGAC	4920
	AAAAAGTAAC AATCGTTGAG AAAGGTAATC TTGGTGGTGT TTGCTTAAAC GTAGGATGTA	4980
10	TTCCTTCAAA AGCATTACTA CATGCTTCTC ACCGTTTTGT TGAAGCACAA CATTCTGAAA	5040
	ACTTAGGTGT TATTGCTGAA AGTGTTTCTT TAAACTTCCA AAAAGTTCAA GAATTCAAAT	5100
	CATCAGTTGT TAATAAATTA ACTGGTGGTG TTGAAAGCTT ACTTAAAGGT AACAAAGTTA	5160
15	ACATCGTTAA AGGTGAAGCA TATTTCTGTAG ATAACAATAG CTTACGTGTT ATGGACGAAA	5220
	AGAGCGCACA AACATACAAC TTTAAAAATG CAATCATTGC AACAGGTTCA AGACCAATTG	5280
	AAATCCTAA TTTCAAATTC GGTAAACGTG TTATCGACTC AACAGGTGCT TTAAACTTAC	5340
20	AAGAAGTACC aGGTAAATTA GTTGTAGTTG GTGGAGGATA CATTGGATCA GAATTAGGTA	5400
	CAGCATTGTC TAACTTTGGT TCAGAAGTAA CCATCCTTGA AGGTGCTAAA GATATCTTAG	5460
	GTGGCTTCGA AAAACAAATG ACACAACCTG TTAAAAAAGG TATGAAAGAA AAAGGTGTTG	5520
25	AAATCGTTAC TGAAGCTATG GCTAAATCAG CTGAAGAAAC AGATAACGGA GTTAAAGTTA	5580
	CTTATGAAGC TAAAGGCGAA GAGAAAACAA TCGAAGCTGA TTATGTATTA GTAAGTGTAG	5640
	GTCGTCGTCC AAACACAGAC GAATTAGGCC TAGAAGAATT AGGTGTTAAA TTCGCTGACC	5700
30	GTGGATTATT AGAAGTTGAT AAACAAAGCC GTACGTCTAT CAGCAATATC TATGCAATTG	5760
	GTGATATCGT TCCAGGTTTA CCACTTGCTC ACAAAGCTAG CTATGAAGCT AAAGTTGCTG	5820
	CTGAAGCAAT TGATGGTCAA GCTGCTGAAG TTGATTACAT TGGTATGCCA GCAGTATGCT	5880
35	TTACTGAACC AGAATTAGCT ACAGTTGGTT ATTCAGAAGC GCAAGCTAAA GAAGAAGGTT	5940
	TAGCAATTAA AGCTTCTAAA TTCCCATATG CAGCAAATGG TCGTGCATTA TCATTAGATG	6000
40	ATACTAACGG ATTTGTTAAA CTTATTACAC TTAAAGAAGA TGATACTTTA ATCGGTGCTC	6060
	AAGTAGTTGG TACTGGTGCA TCAGATATTA TCTCTGAATT AGGTTTAGCA ATTGAAGCTG	6120
	GTATGAATGC TGAAGATATC GCATTACAA TCCATGCACA TCCAACATTA GGTGAGATGA	6180
45	CTATGGAAGC AGCAGAAAAA GCTATCGGAT ACCCAATCCA TACAATGTAA TAACTGATTA	6240
	TCTATAAAGA TTCAGTCATT AAAAGCTGTA GCATATGCTA CGGCTTTTTT GTTTTAGGTA	6300
	AAGTAATGTA AGGAAATTGA TTTGAGATAT CGTTAACATG TGACATGCAT GTTATACTAG	6360
50	CGATGCTAAT AAAAGAATTG AAATGGAGGG TTCAACAATG GAATATGAGT ATCCAATTGA	6420
	TTTAGACTGG AGTAATGAAG AGATGATTTC AGTGATAAAT TTCTTTAATC ATGTAGAGAA	6480
55		

AATTGTGCCT GCTAAAGCAG AGGAAAAACA AATTTTAAAT ACTTTCGAAA AAAGTAGTGG 6600
 CTATAATAGT TACAAAGCAG TTCAAGATGT AAAAAGTAC TCTGAAGAAC AAAGAGTAAC 6660
 5 AGCTAAATAA TAATTCGTTT GAAATTAACA CAATTTAATA GGAATTTTTC TTAAAACTA 6720
 TTGCTAATAA AGCTATATTT TGATACCTTT ATCAAGTGTT AAACAAAATG TTTGATAAAA 6780
 GTAAACTTAA TATAGCTTTT TTAGGTGGAA AAATAAATGA ACATAGGTAA TAAAATTAAA 6840
 10 AATCTTAGAA GAATTAATAA TTTAACGCAA GAAGAACTTG CTGAACGTAC AGACTTATCG 6900
 AAAGGCTACA TTTCACAAAT AGAAAGTGAA CATGCCCTAC CAAGTATGGA AACTTTCCTA 6960
 AATATTATAG AGGTGTTAGG AACGACGCCA AGTGAATTTT TTAAAGACAG TGAAAATGAA 7020
 15 AAAGTATTAT ACAAGAAGGA AGAACAAGTT ATTTATGATG AGTATGATGA AGGTTATATA 7080
 TTAAATTGGT TAGTTTCAAA GTCAAATGAA TATGATATGG AGCCATTAAT ATTAACCTTA 7140
 AAGCCTGGAG CATCATATAA AAATTTTAAAT CCATCAGAGT CTGATACGTT TATTTATTGT 7200
 ATGTCAGGTC AGATAACACT TAATTTAGGC AAAGAGATAT ATCAAGCACA AGAAGAAGAC 7260
 GTTTTGTATT TTAAAGCACG AGATAATCAT CGTTTGTCAA ACGAATCAAA CAATGAAACA 7320
 25 CGAATACTTA TTGTAGCGAC AGCTTCATAT TTATAGGGGG GATCTTATTT GGAACCGTTA 7380
 TTATCATTAA AATCAGTTAG TAAAAGCTAT GATGATCTTA ATATCTTAGA TGACATAGAT 7440
 ATTGATATTG AATCAGGATA CTTTTATACA TTATTAGGTC CTTCAGGTTG TGGTAAACA 7500
 30 ACAATTTTAA AATTAATTGC AGGGTTTGAA TATCCTGACA GTGGTGAAGT GATTTATCAA 7560
 AACAAACCAA TTGGTAATTT ACCACCAAAT AAACGTAAAG TGAATACAGT CTTTCAAGAT 7620
 TATGCATTAT TTCCACACTT AAACGTCTAT GATAATATCG CTTTGGTTT GAAATTAAAA 7680
 35 AAATTATCAA AAACCGAAAT TGATCAAAAA GTAAGTGGG CATTAAAATT AGTAAACTT 7740
 TCAGGTTATG AAAAAAGAAA TATTAATGAA ATGAGTGGCG GACAAAAGCA ACGTGTGCA 7800
 ATTGCACGTG CTATCGTAAA TGAACCAGAA ATATTATTGT TAGATGAATC TTTATCCGCA 7860
 40 TTAGATTTGA AATTGCGTAC TGAAATGCAA TATGAATTAC GAGAATTGCa ATCTAGATTA 7920
 GGTATTACAT TTATATTGT aACACATGAT CCA 7953

(2) INFORMATION FOR SEQ ID NO: 153:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 2347 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

EP 0 786 519 A2

	GGCGTGATCA TACGACCGTC ATTCATGCTC ATGAAAAAAT ATCTAAAGAT TTAAGAAG	60
	ATCCTATTTT TAAACAAGAA GTAGAGAATC TTGAAAAAGA AATAAGAAAT GTATAAGTAG	120
5	GAAACTTTGG GAAATGTAAT CTGTTATATA ACAGCACTAA TGATnACAAT CATTTTTAC	180
	ATTTCTATAT GCTAATGTGG CAAGATGAGC AAAACTCATT TTGTGGATaA TGTTTaAAAG	240
	TCATACACAC CATACACAAG TTATCAACAT GTGTATAAyT cGcCAAATCT ATGTTTTTAA	300
10	GACTTATCCA CCAATCCACA GCACCTACTA CTATTACTAA GAACTTAAAA CCTATATAAT	360
	TATATATAAA CGACTGGAAG GAGTTTTAAT TAATGATGGA ATTcACTATT AAAAGAGATT	420
15	ATTTTATTAC ACAATTaAAT GACACATTAA AAGCTATTTT ACCAAGaACA ACATTACCTA	480
	TATTAAGTGG TATCAAAATC GATGCGAAAG AACATGAAGT TATATTaACT GGTTCAGACT	540
	CTGAAATTTT AATAGAAATC ACTATTCCTA AAAGTGTAGA TGGCGAAGAT ATTGTCAATA	600
20	TTTCAGAAAC AGGCTCAGTA GTACTTCCTG GACGATTCTT TGTTGATATT ATAAAAAAT	660
	TACCTGGTAA AGATGTTAAA TTATCTACAA ATGAACAATT CCAGACATTA ATTACATCAG	720
	GTCATTCTGA ATTTAATTTA AGTGGCTTAG ATCCAGATCA ATATCCTTTA TTACCTCAAG	780
25	TTTCTAGAGA TGACGCAATT CAATTGTCGG TAAAAGTGCT TAAAAACGTG ATTGCACAAA	840
	CAAATTTTGC AGTGTCCAcC TCAGAAACAC GCCCAGTACT AACTGGTGTG AACTGGCTTA	900
	TACAAGAAAA TGAATTAATA TGCACAGCGA CTGACTCACA CCGCTTGGCT GTAAGAAAGT	960
30	TGCAGTTAGA AGATGTTTCT GAAAACAAAA ATGTCATCAT TCCAGGTAAG GCTTTAGCTG	1020
	AATTAAATAA AATTATGTCT GACAATGAAG AAGACATTGA TATCTTCTTT GCTTCAAACC	1080
	AAGTTTTATT TAAAGTTGGA AATGTGAACT TTATTTCTCG ATTATTAGAA GGACATTATC	1140
35	CTGATACAAC ACGTTTATTC CCTGAAAACT ATGAAATTAA ATTAAGTATA GACAATGGGG	1200
	AGTTTATCA TCGATTGAT CGTGCCTCTT TATTAGCGCG TGAAGGTGGT AATAACGTTA	1260
	TTAAATTAAG TACAGGTGAT GACGTTGTTG AATTGTCTTC TACATCACC AATTTGGTA	1320
40	CTGTAAAAGA AGAAGTTGAT GCAAACGATG TTGAAGGTGG TAGCCTGAAA ATTTCAATCA	1380
	ACTCTAAATA TATGATGGAT GCTTTAAAAG CAATCGATAA TGATGAGGTT GAAGTTGAAT	1440
45	TCTTCGGTAC AATGAAACCA TTTATTCTAA AACCAAAAGG TGACGACTCG GTAACGCAAT	1500
	TAATTTTACC AATCAGAACT TACTAAAAAT AAATATAAAT AAAGGATGAC GTGATTAAAT	1560
	AAAACGTCAT CCTTTATTTT TTGGCAAAAA TAATTCTAGG TGCGTATGTA AAATAAATT	1620
50	GGCAGCATTT TAAACAGCAA ATAAAAGACG CCAATTAAAT TTATGACAAA TGTATCCAAA	1680
	ATTTAATAAG TGTGCTTATA TGCCCTTTAA ATTTAAATTT TTAATAGTCA ATAACAAGTT	1740

55

AAAAATAAGA ATTAATTATT TATATGTAAA CGGTTTCTAC CTCTATTTTA AATGAAATTT 1860
 GTGACAAAAA AAGGTATAAT ATATTAATGA CATACAAAGA AATGGAGTGA TTATTTTGGT 1920
 5 TCAAGAAGTT GTAGTAGAAG GAGACATTAA TTTAGGTCAA TTTCTAAAAA CAGAAGGGAT 1980
 TATTGAATCT GGTGGTCAAG CAAAATGGTT CTTGCAAGAC GTTGAAGTAT TAATTAATGG 2040
 AGTGCGTGAA ACACGTCGCG GTAAAAAGTT AGAACATCAA GATCGTATAG ATATCCCAGA 2100
 10 ATTACCTGAA GATGCTGGTT CTTTCTTAAT CATTTCATCAA GGTGAACAAT GAAGTTAAAT 2160
 ACACTCCAAT TAGAAAATTA TCGTAACTAT GATGAGGTTA CGTTGAAATG TCATCCTGAC 2220
 GTGAATATCC TCATTGGAGA AAATGCACAA GGGAAAGACA AATTACTTGG GAATCAATTT 2280
 15 ATACCTTAGC TTTAGCAAAA AGTCATAGAA CGAGTAATGG ATAAGGGACT CCATACCGTT 2340
 TTAATGC 2347

(2) INFORMATION FOR SEQ ID NO: 154:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 13542 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 25 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 154:

30 ACAAGACGTh TCTATAACTT ATCTGAAATC GTCGTCGAAG ATAAAGATTA TGCAACTATC 60
 TCATTCTTAA ACTGGTTCTT AGATGAACAA GTCGAAGAAG AATCAATGTT TGAAACTCAC 120
 ATCAATTATT TAACTCGTAT CGGCGATGAC AGCAATGCAT TATATCTTTA CGAAAAAGAA 180
 35 CTTGGCGCTC GTACATTCGA CGAAGAATAA TTAAACATCA CTACAATAGA CAGATAAATA 240
 TCATACGACA TGATAGGCAT TTGGGTCACT TACAATAACC CAATGTCTAT ATTATTTTGC 300
 TTTACGGAGA TCACTAGATT CATTCTCTGA ATCATTGATC TCGGTTTTTT CATTCTCAAG 360
 40 GCTAATTATT GTATTTTTAG TCATTTATTT TTTAAACTAC TAATGTTAAT AACTCTAAAT 420
 TTGATGTTGA ATTAATTTGA CGATTTTAAA GCATATCATC ATTTACTTTT TAATCAGAGT 480
 45 TACATCCAAA TGATAGATTT CACGTTATAC CTTACGTAT AATATTATGT ATCGTTTGTA 540
 AGCAAATGAC TAAAAGTCTA TTAATATATA CATTTAATTA ATTGAAAGGA TTGACTACAT 600
 GATACAAGAT GCGTTTGTTG CACTTGATTT TGAAACAGCA AATGGTAAAC GTACAAGTAT 660
 50 TTGTTCTGTC GGAATGGTTA AAGTCATTGA TAGTCAAATA ACAGAAACAT TTCATACTCT 720
 TGTGAATCCG CAAGACTATT TTTCAACAACA AAATATTAAA ATTCATGGCA TACAACCAGA 780

55

EP 0 786 519 A2

5
 10
 15
 20
 25
 30
 35
 40
 45
 50
 55

aGATTTACCT GTTGTGCGAC ATAACGCGGC ATTTGATATG AACGTCTTAC ATCAAAGCAT 900
 TCAAAATATT GGTTTACCAA CTCCAAATTT AACTTACTTT TGTAGTTATC AACTTGCTAA 960
 AAGAACCGTT GATTCGTATC GATACGGTTT AAAACATATG ATGGAGTTTT ATCAATTAGA 1020
 TTTTCATGGT CATCATGATG CATTGAATGA TGCCAAAGCA TCGCAATGA TTACTTTTAG 1080
 GCTACTGAAA AATTATGAAA ATTTAACATA TGTAACATAAT ATTTATGGTA AAAATCTAAA 1140
 AGATAAAGGC TAGGACTAAA TAAATACTC CCTTCAAAG TAAGCATTGT AAAAATGTAA 1200
 ACTTTGCAGG GAGCTTTATT TTATATAAAG TCATATATCG TCATATTTTT ATAAGTTGAT 1260
 TGTTCTAAAT TACCTACAGT GACACCAATA AGTCGAATTG GTACATCAGG GTCTTTTAAA 1320
 TCGTTATAAA GTAAATATGC AATATTATAA ATATCTTCTT CAGAACTAAC CGAATCTCTT 1380
 AAACATCATCT GTTTAGATAG CGTTTCAAAT TGATAAGTTT TAATTTTAAC CGTTACAGTT 1440
 TTAGCTGACT TCTGTAATTT ATTTAGACGT TCAGCTGTTT TACCTGnACA ATTCCCATAC 1500
 TTTTCTTAAA ATCTCTTCAT CATCATTCAC GTCTGTTGCA AATGTGCGTT CAGTCCCTAC 1560
 TGATTTTCTT ACTCTTGATG ATTTCACTTC ACTATGGTCA ATACCGCGTG CCTTGTTATA 1620
 TAAACCCCGA CCTCTTTTTT CAAACAAACG TATTAATTCA AATTCGGTTT TCTCATATAA 1680
 ATCTCTACCG TAAAAATAC CATTATCATG CATTACTTTT TTGGAAGCTT TACCTACGCC 1740
 TGGaAAATCT CCAATATCCA ATGTCATCAA AATATCATGG aCATTTTGAT AATCAATCAC 1800
 AGTCATACCA TCAGGTTTAT TCATACCACT CGCTAATTTA GCTAAAAATT TGTTATAAGA 1860
 AACACCTGCA GATGCTGTTA AATGTGTCTG CTCTAGAATA TCTTTTCTAA TATACTGAGC 1920
 AATTTTCGAA GCAGGAAGGT CTGGTCTCAC TAATTCTGTA ATATCTAAAT ACGCTTCATC 1980
 CAATGACATC GGTTCACCT TATCTGTATA ACTTCGAAA ATAGACATAA TCTGCGCAGA 2040
 TGTCTCTCGG TAAGCACCAA AATTACTTGT GACAAAGTAT CCATTTGGAC ATAATTTATG 2100
 CGCTTGAGAC ATAGGCATTG CTGAATGGAC GCCGTATTTT CGTGCTTCAT AGGATGCCGT 2160
 AGAGACAACA CCCCTACTGC TTGCTTTACC ACCAACAATG ACTGGTTTCC CTTTCAATTT 2220
 GGGGTATCT CTCATTTTCA CTTGTGCAAA AAAATAGTCC ATATCTATAT GAATAATTG 2280
 TCTCTCAGTC AAGTGCTCAC CTCCCTACTA ATTTTACTT TTATAACGCA CAAAATATC 2340
 TCAACATAAT TATACGCTGT GTACGATTTT TTTACATAAA TCTTGCACTT AGCGATAACT 2400
 ATATTGaGAT AACTACAAGT TGTTATaAAA TCAATTGCTA TTTAAGCATG ATGATGAAGA 2460
 CGATTGAGTA AGAAAACATA GGTAATCTGA AATAATTCAA GCAAATTCAT TTTGTTGGTA 2520
 TCATCATATT AAAATTTATT ATTGAGTCGG CTTTGTGATGA TACAAATAAA TACTATCTTC 2580

EP 0 786 519 A2

	AAAGCAATAA GCGGTATGCA TACTAAACAT AAAAATAAGT GATGAATAAC CAAATACCTT	2700
	AATTAATAA AGCAAGCCAG TACTTAATAG GATTAGTGGT GACAGCATAA TAATTGAGAA	2760
5	TTGCCATTG TTGAAGCAAG CATCTGCTGT TTGGAATAAG ATTCTGTCTT TTTTATATT	2820
	AAACATAGGT TTGCTATCTT TTTTAAATAA AAGAAATAAT GCTCTATGGA TAAGTTCATG	2880
10	TAAAATCAAT AAAATAATGA ATCCAGCAAA CCCATATACA AGATTGATGA TGATATTTTG	2940
	ATCGACAACC GCTGTGACAC CTAACGCCCA CTTATACGTA AATAAAATCA CGAATAACGC	3000
	AATAACAAGT TGCAAGATAA TAAACCTTCG CATTTGAAAA TTATTTGTCTG TTAAATCAAT	3060
15	TTTATGCATT ACCAACCCTC CCGATCATGA CATTCTTATT CTTCTTTAAA TATAGTATAC	3120
	AATGTCACAT TTAATTTAAA AAGTTCATAT CAAGAAAGTA AATTGGCTGT AATAAAATTT	3180
	TAATATACGA CTTCTTTCTT CACTTATTAA GCGGAAATTT TATCTCAAAT CATGTGCGCT	3240
20	ATTTCAAATT GAATAATGCC ACTGTCTCAA CATGTGTTGT TTGTGGAAAC ATATCTACCG	3300
	GTGTTACCTC TTCAAGTTGA TATTTTTCAG CTAATAATAA TGCATCACGT TGCTGTGTTG	3360
	CGGGATTACA TGAAATATAG ACAATACGCT TAGGTTCTAA TGTAAGCAAA GTCTGAATAA	3420
25	ACGTTTCGTC ACAGCCCTTT CTTGGCGGAT CAACCATTAC AACATCTGGT TTAATCCCTT	3480
	GTGCTTTCCA TTGTAAAATA ACTTCTTCAG CTTTCCACA GACAAAAGTT GTATTATTGC	3540
	ATTGGTTTAT AGTCGCATTT TGTGTGCGT CTTCAATTGC AGAAGGTACT ACTTCAACAC	3600
30	CGTATACATG TTTTGCAAGT GGTGCCATAT ATAGCCCTAT TGTCCAATA CCACAATAGG	3660
	TATCTAATAC AACTTCATTA CCTGTCAATT GCGCATACTC AATTGCTTTA TTATATAATT	3720
35	TCTCTGTTTG TTCAGAATTA ATTTGGTAGA ATGACTGATC ACTTATTTTA AATGTACTAT	3780
	CTGTTAATTG ATCAATAATT GTATCTTTAC CATATAGCGT TATAGATTGA CGTCCCATAA	3840
	TAACATTAGA GTGGCTATCA TTAATGTTTT GTTTAATGCT TGTACATTA GGAAATGCAT	3900
40	CTAATATCTT CTCAACAACA GCATTTTTTT GTGGCCACTT TTTACCATTA GTTACAAAAA	3960
	TAATCATCAT TTCGTCTGTA TGATATCCTG TTCTTACAAC CAAATGTCTC ATTAAACCTT	4020
	TTTTCAATTG TTCTTGATAA ATACTTACAT TTAAATCTTT TAAAATAGAT TTAACCTCAT	4080
45	TCATCACTTC TTGATGTTGT GAATCTTGTA TTAAACAAC TTCCATGTCA ATAATGTCAT	4140
	GGCTTCTTTG ACGATAAAAG CCCATAATAA CTTCAATTCTG TTCATTCTTA CCAACTGGAA	4200
	TCTGGGACTT GTTTCGATAT CTCCAAGGAT CTGTCATGCC AACTGTATCG TTAATCTTAG	4260
50	AATTATCAAA ATGCGCTTTT CGCTGAAACA AATTAATCAC TTGTTCCCTT TTCATTTCAA	4320
	GTTGTGCTTC GTATGATAAG TGTGAAGTT GGCACCCACC ACAACGTTCA TAATATATAC	4380

55